Spring 5-7-2021

From Shelter to Home: Creation of Home in Areas of Poverty and Scarcity

Claudia Rateb

FROM
SHELTER
TO
HOME

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CREATION OF HOME IN AREAS OF POVERTY AND SCARCITY

Minya, Egypt

Request for Approval of Thesis Research
Project Book Presented to:

Christopher Welty and **Arief Setiawan**

and to the
Faculty of the Department of Architecture
College of Architecture and Construction Management

By

Claudia Rateb

In Partial fulfillment of the requirements for the Degree

Bachelor of Architecture

Kennesaw State University
Marietta, Georgia

May 7, 2021

ACKNOWLEDGEMENTS . . . . . .

This thesis would not have succeeded if not for the tremendous help and push from my advisors, Christopher Welty and Arief Setiawan. Through their consistant pushes to research and think in ways difficult to me, I was able to grow as both a student and a person.

I would also like to acknoledge my fellow peers for providing a supportive and creative environment as a class throughout the years. Without the acceptance and support of my classmates, I would not have been able to keep my head collected through this rigorous program.

THESIS ABSTRACT

Research Problem
Areas of scarcity among third-world countries are often subject to poverty stemming from a variety of reasons. Focusing specifically on Minya, Egypt, extreme poverty is a result of a combination of factors. These factors largely include but are not limited to systemmatic targeting of religious minorites, lack of potable resources, lack of education among the region, poor transit and distance from employment opportunity, and governmental corruption. As a result, slum-like conditions arise within and directly outside the city of Minya, creating unsafe and undignified living conditions to people affected by poverty. These living conditions further the wedge between the poor and wealthy, preventing those in unfortunate circumstances of a chance out to a better life. While architecture may not be able to solve the root causes of sytemmatic poverty, it can be explored in order to alleviate some aspects which further a divide. Housing which provides access to the basic needs of human life is a fundamental step in dignifying members of a targeted community. In areas of scarcity, such as the selected site, problems arise when attempting to create an affordable, livable, home.

Methodology
In order to derive a method suited for mass housing, studied were a number of items. Multifamily housing typologies and their organizational components were studied in order to derive what typology of building may work if the route of multifamily housing was selected. Western housing standards and Middle Eastern housing standards and models of living were compared in order to potentially create solutions if a foreign aspect were to be introduced. Egyptian veraculars were studied in order to design stylistically seamlessly according to the site. Ideologies for building methods, communal aspects, modularity, and types of incremental housing were studied in order to create a design addressing the needs of the inhabitants. Studied elements were mainly diagrammed and analyzed in order to determine their place (or lack thereof) in the final design.

Key Results
While aspects of each study were applied to the final design, main design methods were gathered from the incremental housing studies. This was done in combination with the comparison of Western versus Middle Eastern living standards, which introduced a less private model than typically found in Minya. By applied more shared/communal space, personal ties are formed between the inhabitants of the masterplanned site. Through community, growth occurs.

Conclusion
Main takeaways pointed in the direction of an incremental housing scheme formed from a series of clusters being a fitting design choice for the given problem. An inhabitant-built multi-phase project using a Middle Eastern living model creates for a home where the impovershed can grow according to the individual. This creates a sense of autonomy and place.

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SECTION 1: INTRODUCTION

1.1 DESIGN HYPOTHESIS

People living in remote areas of the world are some of the most likely to be struck by poverty, creating a dilemma of secure living spaces. Elements out of an individual's control have extreme potential to cause devastation. Oftentimes, the communities of these areas do not have proper shelter, and those who do have shelter are often in poor condition or poorly constructed. Much of the communities and shelters in these areas display slum-like conditions. Adding onto the issue, many remote areas do not have access to a reliable power source, essentially making them "off the grid."

"From Shelter to Home" conducts research in criteria explorable to create effective and welcoming shelter to those in need who are stricken with little or without resources. The research focuses on techniques and materials tried and tested in similar conditions to the selected site of Minya, Egypt. The research also focuses on the definition of a "home" throughout cultures, encompassing these values and ideals to create an equitable living space.

Areas of research may include:
- *Creation using only locally accessible materials*
- *Cost effective materials and construction methods*
- *Methods for overall affordability*
- *Construction methods conducted with minimal displacement or disturbance*
- *Modularity and prefabrication*
- *Efficient construction time and methods*
- *Innovative uses of available materials*
- *Maximizing potential of limited resources*
- *Recycling old building elements*

Each of these selected interests draws special attention to issues where building shelters lack. Ultimately, shelters created are intended to create a higher quality of life for those who otherwise have to bare harsher conditions than many.

This thesis argues for a sustainable alternative to the lack of shelter provided in an area struck by extreme poverty. Specifically, it investigates how a solution through architecture can be found for areas lacking resources. Through a site-sensitive implementation of researched architectural techniques, a "home" will be created rather than a shelter. The "home" encompasses the basic needs of equitable life, all suited into a central space.

The design project is a minimalistic community created from shelters encompassing the elements of "home," using creative and innovative implementation of the limited sources and materials easily accessible and transportable to Minya, Egypt.

1.2 PROJECT NATURE, CONTEXT, & RATIONALE

The universally immediate basic needs of life consist of food, water, clothing, and shelter. A step deeper reveals that one also has psychological needs, directly related to love and connection. In the ideal model of any home, one has direct access to all of these human needs. The compilation of these needs together in one place is what creates a home from a shelter. The home is the direct center of basic life in the nature of a human being.

The country of Egypt, like many others, is subject to an extreme division of wealth-based class. The poverty line is set at a bar of a family bringing home the equivalent of $3.20 a day. A third of Egypt's population not only lives below the already low poverty line, but are living in what is classified as "extreme poverty." [1] Aside from the pocketed poverty within the three major cities of Alexandria, Cairo, and Luxor, poverty is displayed in a nearly unlivable condition outside these cities. According to the United Nations Development Program, areas in upper Egypt are typically composed of half or sometimes more of the population living in poverty. [2] This ratio significantly contributes to the country's overall rate of 33%. More often than not, communities in Upper Egypt are struck with poverty to the point of no adequate shelter and resources being the norm.

How does one create a home where the needs of life are not met? The impoverished city of Minya has a shockingly high poverty rate of 60%. Among these nearly two thirds of people, many live without running water or even a proper sewage system connection. [1, 3] Poverty in areas such as Minya are largely driven by poor government, contributing to lack of education, jobs, and transportation. A significant portion of this impoverished community makes the daily trek to find pennies worth of work in the city of Cairo, located roughly 3.5 hours north. Other families even sacrifice themselves or their children as house maids or servants to those of wealthier communities for the chance of a better life. Obviously, these conditions are unacceptable for the barest necessities needed for adequate human life. "From Shelter to Home" takes studies of successful communities and solutions in and for resource stripped areas, applying them to Minya with a focus on Minya's specific conditions. A large influencer and advocate inspiring this design and mindset is Egyptian architect Hassan Fathy, author and designer of Architecture for the Poor.

1: "UN Beneficiary Stories by UNIDO" (PDF).
2: "Social Solidarity Ministry to provide citizens with disabilities financial support". Egypt Independent.
3: "Egypt: The Basic Village Services Program" (PDF). USAID.

1.3 UNDERLYING PRINCIPLES OF DESIGN HYPOTHESIS TO PROPOSED TYPOLOGY

As touched upon in previous pages, the ultimate design of this thesis project is a system of home which adress the basic physical and psychological needs of a single human being or family. The collection of dwelling spaces to be created should sum up both the broad needs of a human being and the individual needs of the being, compiled into one space through architecture.

When approaching the topic of sheltering space for underpriveledged communites, specific principles coming from site and demographics must be considered in order to create a successful design. In order to create a home, a deeper set of principles must also be applied and considered for the project's success. The combination of these principles ultimately shall create a new approach to sheltering space, giving oppurtunity of a home being created from said space. Through design with application of these principles, I aim to create a design to challenge the existing scope of the architecture of sheltering space. From the program I can show the importance of the relationship between the being and the shelter, creating the "home." The success of the being and the success of the shelter or "home," corrolate to each other, creating an opportunity for design to become a factor leading to success in one's life.

"In nature, no two men are alike ... they will differ in their dreams. The architecture of the house emerges from the dream; this is why in villages built by their inhabitants we will find no two houses identical." -Hassan Fathy

Through this quote, Fathy exemplifies the impact of individuality on the architecture of dwelling spaces. The unique design of one's shelter is part of what creates a "home" out of that space. Through this, I aim to explore not only the shelter creation in itself, but the customization and personal tailoring of such shelters, according to need of the group or inhabitant.

Fathy, Hassan. Architecture for the Poor. 1976

1.4 RELEVANCE OF THE DESIGN HYPOTHESIS AND GLOBAL CONTEXT

On a global scale, the situation leading to the demise of well-being in Minya, Egypt, is just one of many similar instances. Minya was chosen in particular because of its personal cultural significance and history.

Coptic Christianity, the oldest speculated denomination of Christianity, is a native minority in Egypt, making up around a tenth of the country's population. In Minya, the population of Coptic Christians is approximately 40%. Beloning to one of the oldest civilizations still active in the modern-day world, the Coptic people in specific have been subject to persecution in Egypt. Typically, areas with higher concentrations of Coptic people correlate with higher levels of poverty due to cultural stigma and corruption in government treatment.[1]

The treatment of the Coptic Christians in Egypt in relation to the creation of an impovershed community is not an unusual situation on the global scale. In regards to the treatment of minorities worldwide, there are many cases of failing communities due to corruption and mistreatment. This is especially notable in, though not limited to, third world and/or developing countries. The implication of poverty in societies with high concentrations of minorities is common worldwide.

Minya, Egypt, exemplifies instances of poverty devised from a mixture of said conditions along with others. These additional conditions consist of general governmental corruption, preexsiting poor organizitation of civilization, and geographical distance from viable resources. Governmental corruption and under-education being rampant prevents communities like the one in Minya from progressing. While architecture cannot solve these issues, it can provide relief to those who are suffering due to circumstances out of their own control.

1: "Egypt: The Basic Village Services Program" (PDF). USAID.

1.5 EXPLORATIVE QUESTIONS

LARGE DICIPLINARY QUESTIONS

What differentiates a shelter from a home?

What defines human want from human need?

How does one create an healthy dwelling space?

How can the most be made from limited resources?

How can resources be provided to areas where there is a scarcity?

How can one design homes of shelters without damaging the local economy?

How can opportunity be provided for an equitable lifestyle in a severely impovershed area?

SPECIFIC RESEARCH QUESTIONS

What materials are locally availible and accessable?

How does one build creating minimal displacement or disturbance to the site?

What building/constructive methods can be used cost effectively for overall affordability?

How can ruins and old building elements be used or reconstructed in a more effective manner?

How can modularity and prefabrication be used most effectively to create site tailored shelters?

How can the availible materials and resources be used in an innovative manner to maximize output?

What methods can be used in order to sacrifice as little time as possible and still retain building quality?

DISCIPLINARY CONTRIBUTIONS

How does tailoring shelter to site improve design?

How can the creation of dwelling space create opportunity?

What elements are overlooked in a traditional sheltering project?

What value does creating “home” from shelter have on a community?

What mistakes are make in the typical approach to a sheltering project?

How can thoughtful design be implemented into shelter creation as a whole?

What oppurtunities can be taken advantage of throughout the entire diciple of creating shelter?

How can modularity and prefabrication be used most effectively to create site tailored shelters?

What elements can be placed in housing and sheltering project to create oppurtunity for self-sustainability?

1.6 INTRODUCTION: **EMPOWERMENT**

What is a slum?

"But what is a 'slum'? The first published definition reportedly occurs in the convict write James Hardy Vaux's 1812 'Vocabulary of the Flash Language,' where is synonymous with '**racket**' or '**criminal trade**.' By the cholera years of the 1830s and 1840s, however, the poor were living in slums rather than practicing them. Cardinal Wiseman, in this writings on urban reform, is sometimes given credit for transforming 'slum' ('room in which low goings-on occurred') from street slang into a term comfortably used by general writers."

-Mike Davis, Planet of the Slums, p. 21

How do we empower through architecture?

Based off of history and negative connotation to the word/label of "slum," how does one empower an inhabitant to break free from this viewpoint? The relabeling of these urban-hybrids could be beneficial. A step forward from this might include providing interactive methods/plans for members to build up both literally and figuratively. Recognition of "self" in such surroundings is likely a better approach than outside people enforcing a new way of doing things.

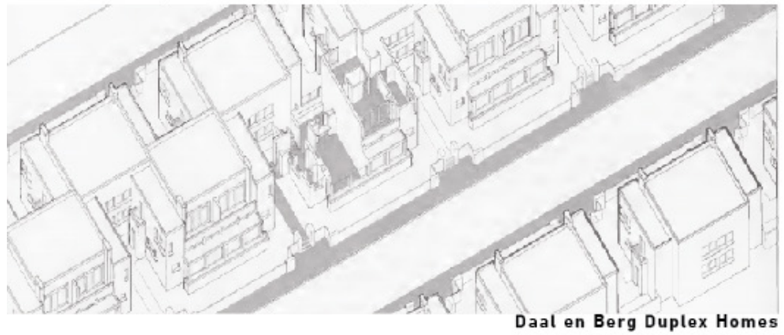
Davis, Mike. Planet of Slums. 2007.


HOME?

SECTION 2: THESIS RESEARCH

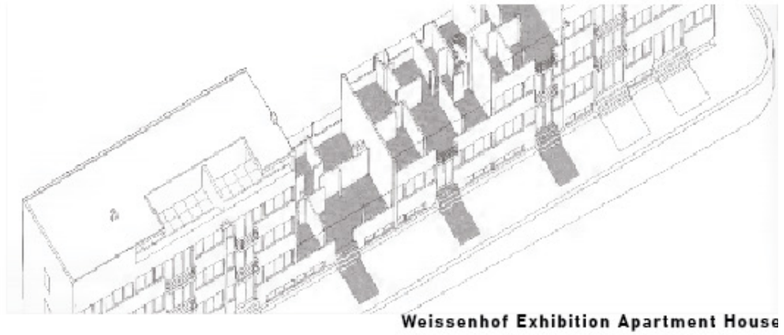
2.1 MULTIFAMILY RESIDENTIAL TYPOLOGIES

[Semi]Detached Housing
Detached or partially detached house/building as its own entity



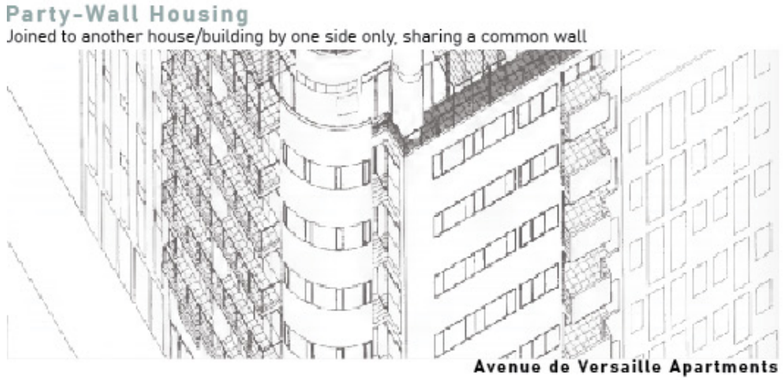
Daal en Berg Duplex Homes

Rowhousing
Joined to another house/building by two sides, sharing 2 common walls on each side



Weissenhof Exhibition Apartment House

Party-Wall Housing
Joined to another house/building by one side only, sharing a common wall

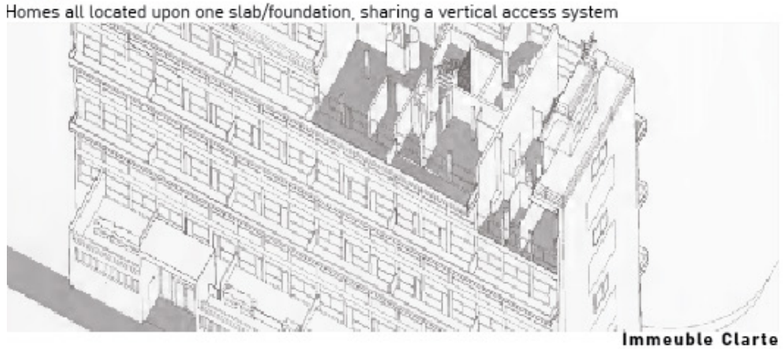


Avenue de Versaille Apartments

Block Housing
Cluster of buildings/homes on a singular or group of street blocks

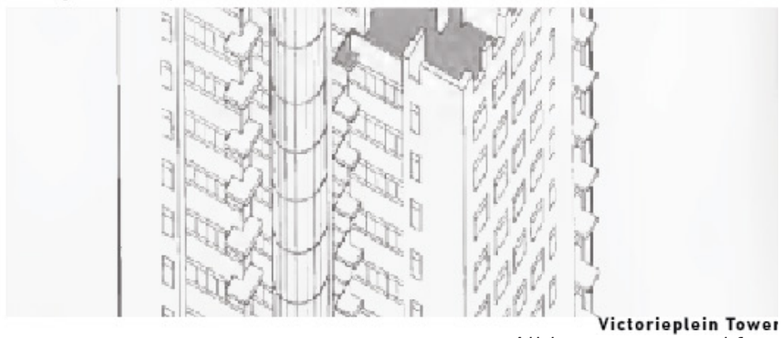
Spangen Quarter

Slabs
Homes all located upon one slab/foundation, sharing a vertical access system



Immeuble Clarte

Towers
Buildings/homes atop of each other



Victorieplein Tower

All images sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 39, 50, 82, 101, 114, 138

2.1.1.1 [SEMI]DETACHED HOUSING

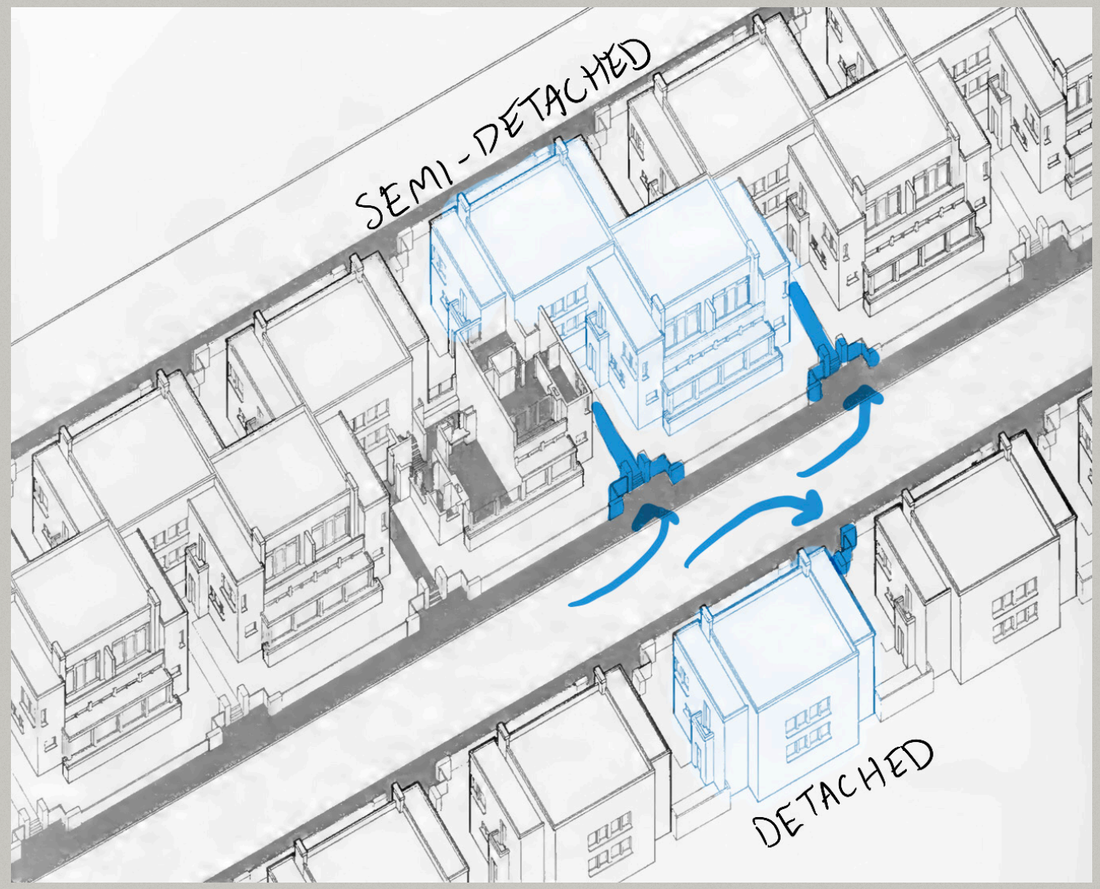
Daal en Burg Duplex Homes

Den Haag, 1920 | Jan Wils

Detached or partially detached house/building as its own entity

Characteristics:
-Multiple units
-Detached entirely from each other or semi-attached
-Urban: Apartments, Duplexes
-Suburban: Detached House
-Typically 2 stories
-Low-rise, intimate scale
-Entries at opposite faces of building, both in detached and semidetached
    -Done at semidetached to create privacy at shared entryway
-2 Typical site arrangements:
    -Side-by-side duplexes facing the street
        -Sometimes has small entry walk & front and back gardens
        -More suitable for suburban or medium-density setting
        -Appears as one continuous building
    -Staggered
        -Has entry court rather than walk
        -Provides for more light towards rear

[1]



1: Sherwood, Roger. Modern Housing Prototypes. 1979

Base image sourced from Sherwood, Roger. Modern Housing Prototypes. 1979, p. 39

2.1.1.2 [SEMI]DETACHED HOUSING

Units

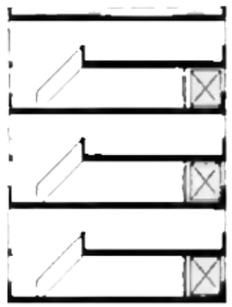
-Double Orientation

Has one out of three connected walls open. This leads to two open walls, or orientations.

"The corner type or 90° double-orientation unit may be seen simply as a singly-oriented unit in which one of the three closed walls has been opened up. This limits the strategies of collecting units together, since each needs a corner, and the use of this type seems to be limited to towers, smaller freestanding buildings, and to certain kinds of terrace housing."

R. Sherwood, Modern Housing Prototypes (p6)

Circulation

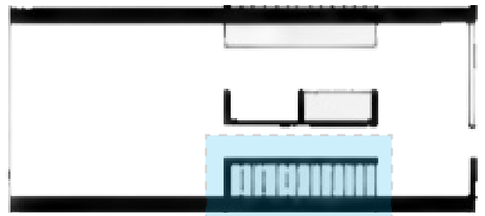


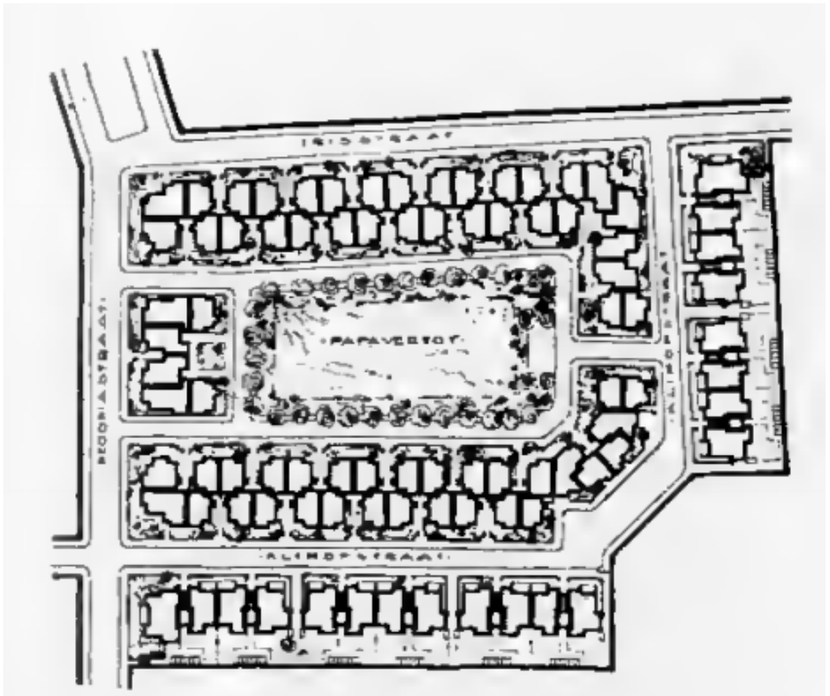
Single-loaded system; corridor every second floor.

Access

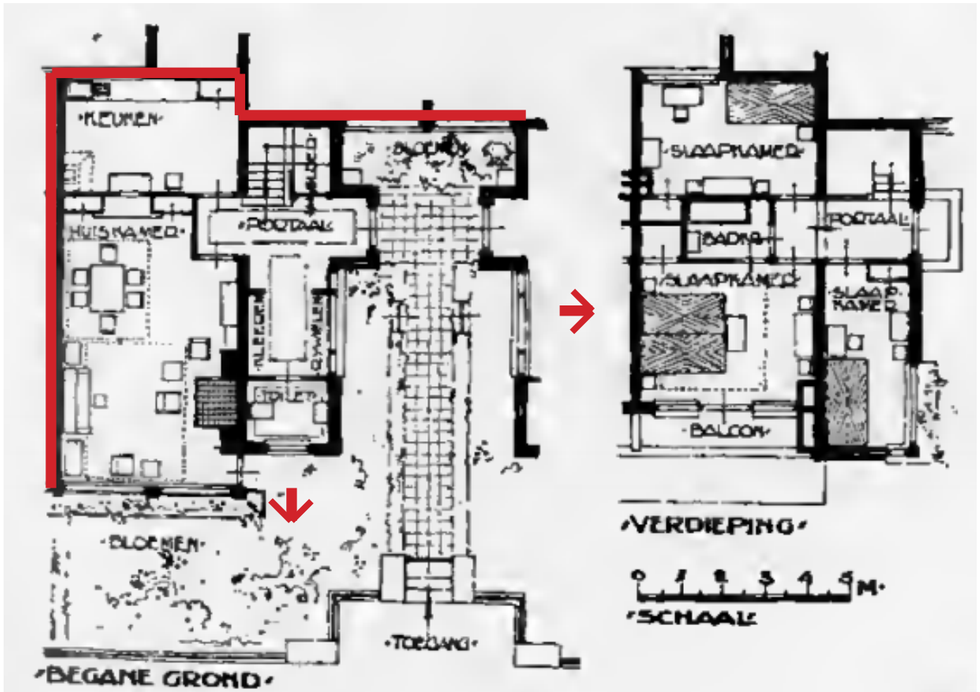
-Private Access

" . . . [P]rivate entrance and private internal vertical circulation. Height is limited by most building codes to two or three stories. Units cannot be stacked vertically and the idea is restricted to rowhouses, detached houses, or terrace houses."





1: Sherwood, Roger. Modern Housing Prototypes. 1979



All base images sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 39-41

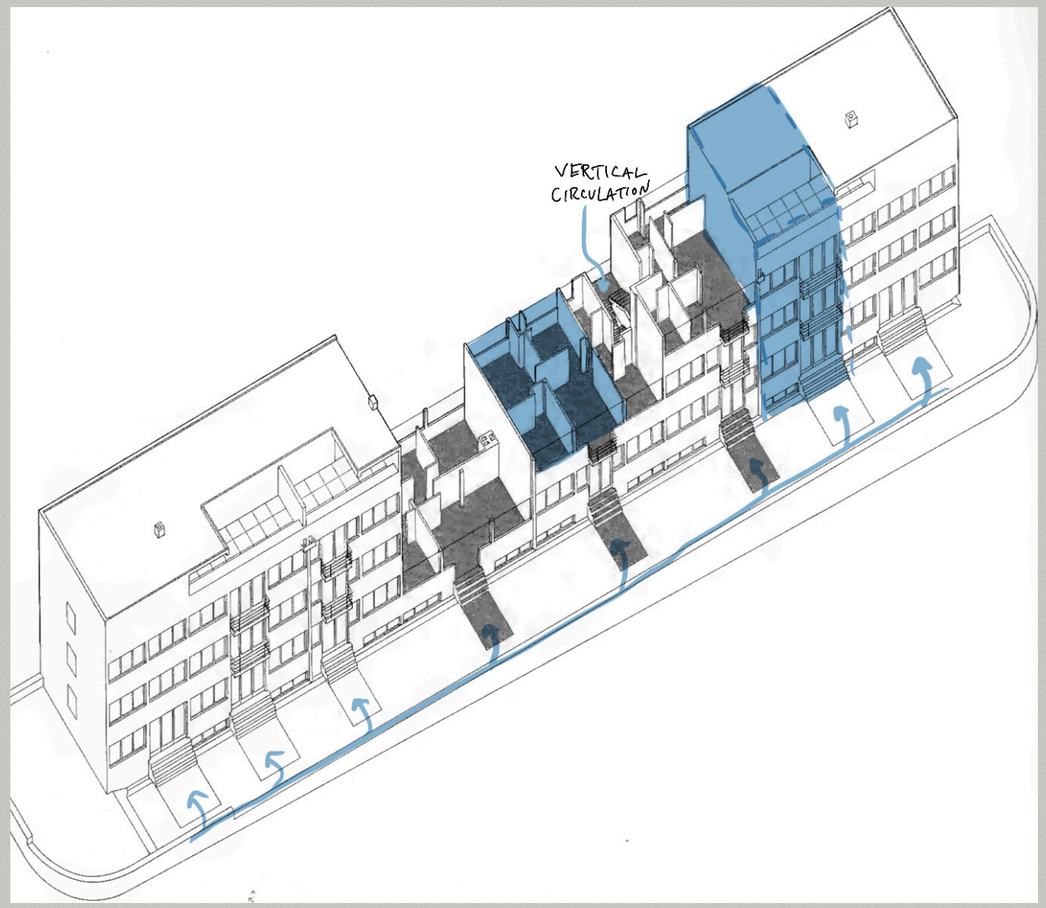
2.1.2.1 ROWHOUSING

Joined to another house/building by two sides, sharing 2 common walls on each side

Characteristics:
-"Serpentine" long overall form
-Typically made up of Open Ended Double-Orientation Units
-Made up of continuous buildings/units of the same or similar height
    -Height is typically either low-rise or intimately scaled (such as in [semi]detached housing)
-Entryways face same direction, typically towards street
-". . . [L]ong, continuous buildings with walk-up units arranged around internal stairs" [1]

Weissenhof Exhibition Apartment Homes

Stuttgart, 1927 | Mies van der Rohe



1: Sherwood, Roger. Modern Housing Prototypes. 1979

Base image sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 50

2.1.2.2 ROWHOUSING

Units

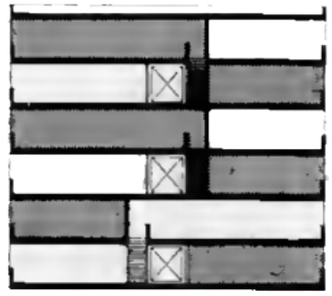
-Open-ended Double-Orientation Units

This unit holds the same properties as a normal double-oriented unit, though does not require there to be a corner. This type of layout is best suited for double-loaded corridors.

"Probably stemming from the common sense advantage of repeating units while still maintaining maximum exterior surface, this system of placing open-ended units side by side is perhaps the oldest form of collective urban housing. A dwelling unit that is open at each end has many organizational options."

R. Sherwood, Modern Housing Prototypes (p10)

Circulation

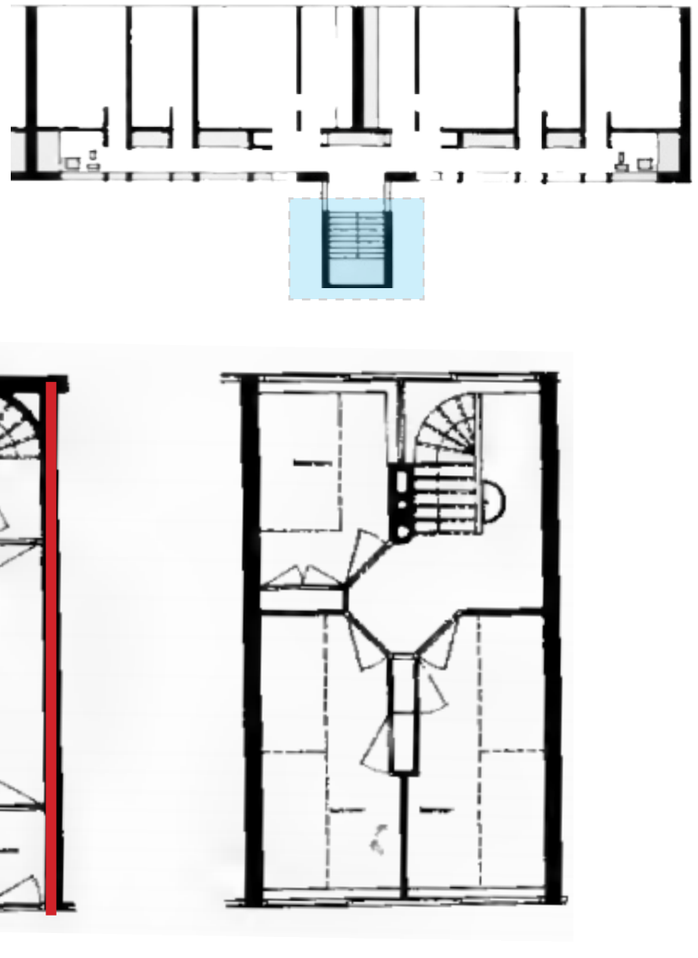


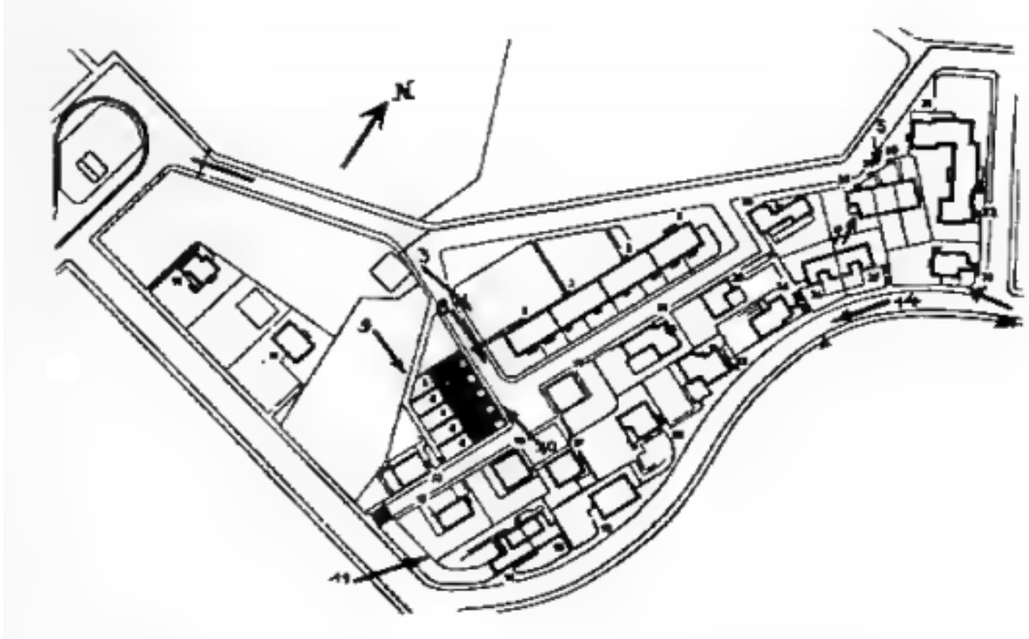
Double-loaded system; corridor every second floor.

Access

-Multiple Vertical Access

This is a system composed of vertical stacking of units/ floor plans. The vertical access core is typically centralized, or in the case of larger buildings, centralized between sets of around 6 units.





1: Sherwood, Roger. Modern Housing Prototypes. 1979

All base images sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 50-54

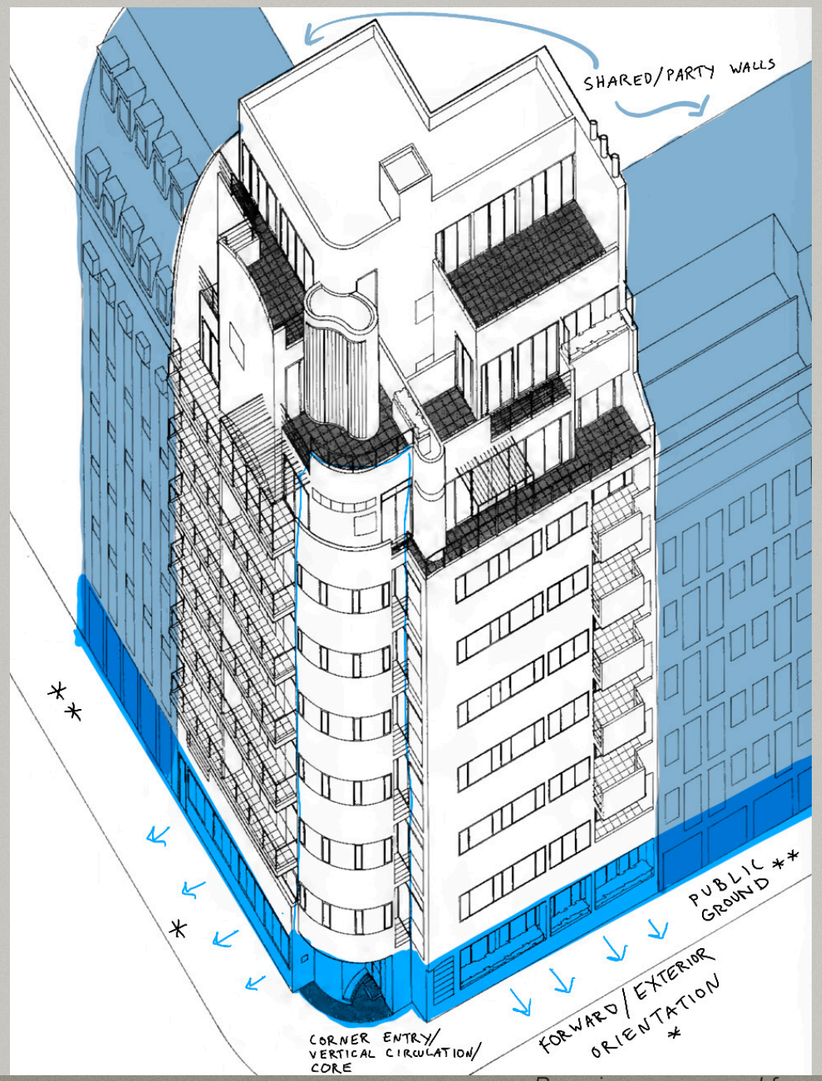
2.1.3.1 PARTY-WALL HOUSING

Avenue de Versailles Apartments

Paris, 1934 | Jean Ginsverg

Joined to another house/building by one side only, sharing a common wall

Characteristics:
-Made up of either:
-Open ended double-orientation units adjacent to buildings on both sides, faces front and rear
-90 degrees double orientation units, facing 2 streets on front and side
-Frontwardly organized
-Units attached at opposite facing corners
-Placement on corner-site is less common but creates for a better layout due to increased views
[1]



1: Sherwood, Roger. Modern Housing Prototypes. 1979

Base image sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p 82

2.1.3.2 PARTY-WALL HOUSING

Units

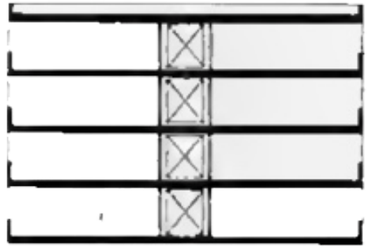
-Double Orientation

Has one out of three connected walls open. This leads to two open walls, or orientations.

"The corner type or 90° double-orientation unit may be seen simply as a singly-oriented unit in which one of the three closed walls has been opened up. This limits the strategies of collecting units together, since each needs a corner, and the use of this type seems to be limited to towers, smaller freestanding buildings, and to certain kinds of terrace housing."

R. Sherwood, Modern Housing Prototypes (p6)

Circulation



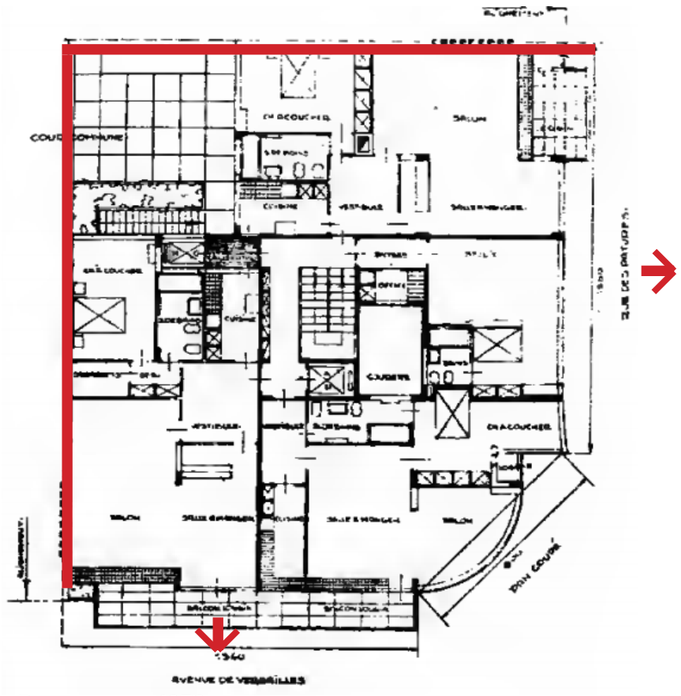
Double-loaded system; corridor every floor.

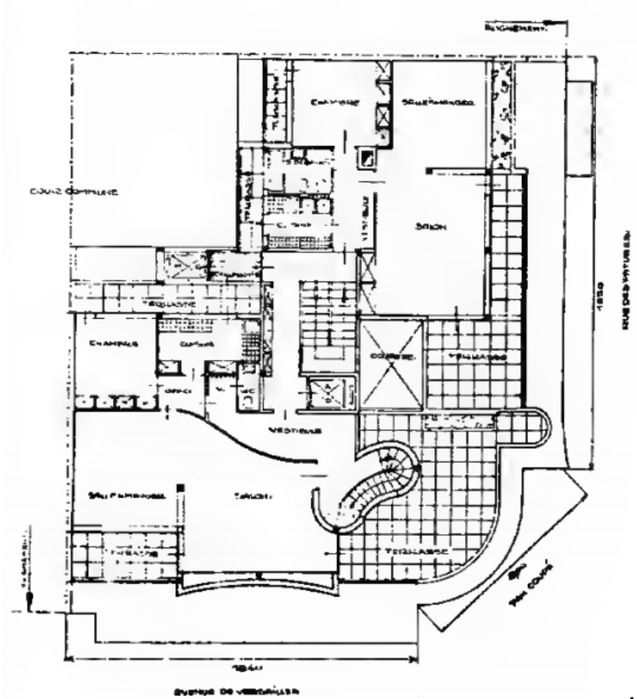
Access

-Multiple Vertical Access

This is a system composed of vertical stacking of units/ floor plans. The vertical access core is typically centralized, or in the case of larger buildings, centralized between sets of around 6 units.

In this case, the centralization occurs in the corner of the building





1: Sherwood, Roger. Modern Housing Prototypes. 1979

All base images sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 82-86

2.1.4.1 BLOCK HOUSING

Spangen Quartier

Rotterdam, 1921 | Michiel Brinkman

Cluster of buildings/homes on a singular or group of street blocks

Characteristics:
-Arranged in small clusters or quarters
-Typically each unit in cluster has a face towards cluster's garden/shared space
-Usually composed of the following:
    -Courtyard/division
    -Central area holding common facilities
        -Heating, laundry, etc.
    -Connecting exterior circulation
[1]

1: Sherwood, Roger. Modern Housing Prototypes. 1979

Base image sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 101

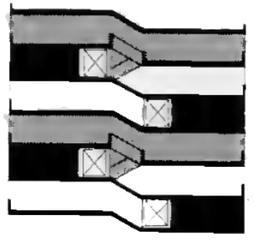
2.1.4.2 BLOCK HOUSING

Units

-Open-ended Double-Orientation Units

This unit holds the same properties as a normal double-oriented unit, though does not require there to be a corner. This type of layout is best suited for double-loaded corridors.

Circulation

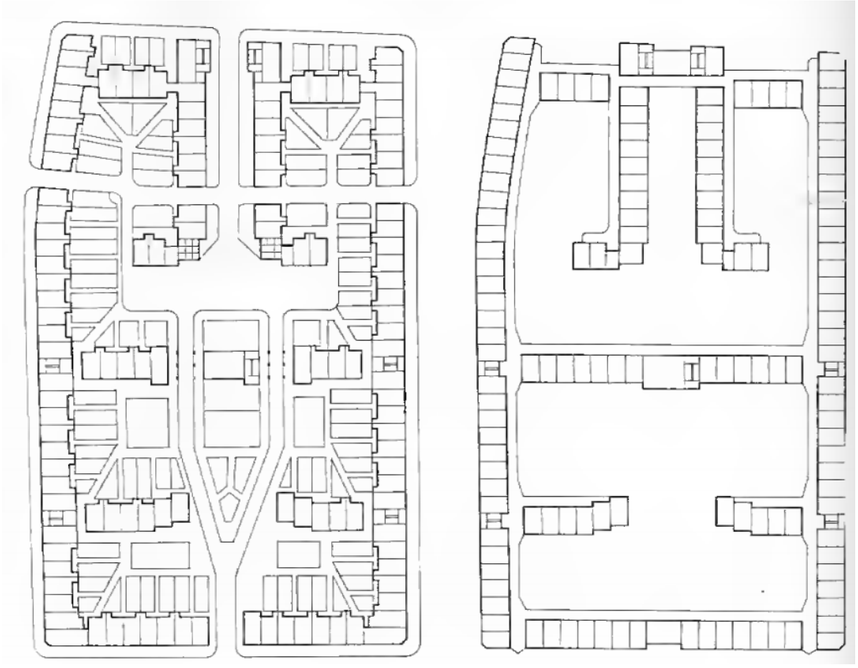


Double-loaded split-level system; corridor every second floor, alternating

Access

-Multiple Vertical Access

This is a system composed of vertical stacking of units/ floor plans. The vertical access core is typically centralized, or in the case of larger buildings, centralized between sets of around 6 units.



1: Sherwood, Roger. Modern Housing Prototypes. 1979

All base images sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 101-105

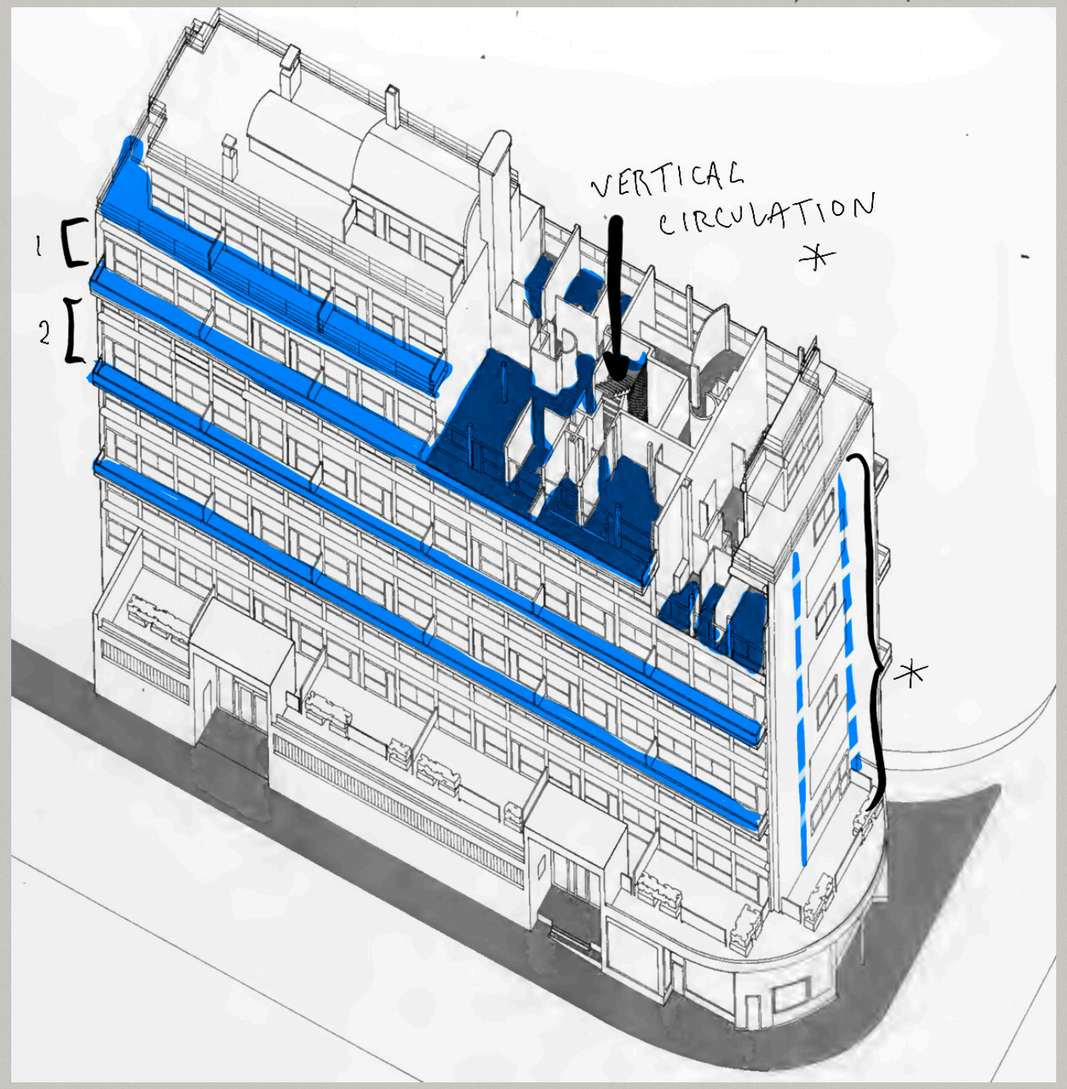
2.1.5.1 SLABS

Immeuble Clarte

Geneva, 1932 | Le Corbusier

Homes all located upon one slab/foundation, sharing a vertical access system

Characteristics:
-Connected by vertical circulation
-Can consist of double-height spaces, leading to split level circulation
-Arranged around central cores
[1]



1: Sherwood, Roger. Modern Housing Prototypes. 1979

Base image sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 114

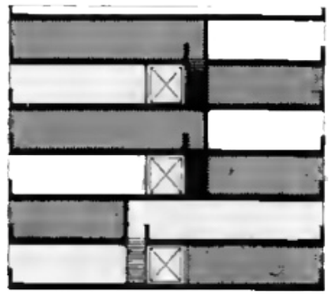
2.1.5.2 SLABS

Units

-Open-ended Double-Orientation Units

This unit holds the same properties as a normal double-oriented unit, though does not require there to be a corner. This type of layout is best suited for double-loaded corridors.

Circulation

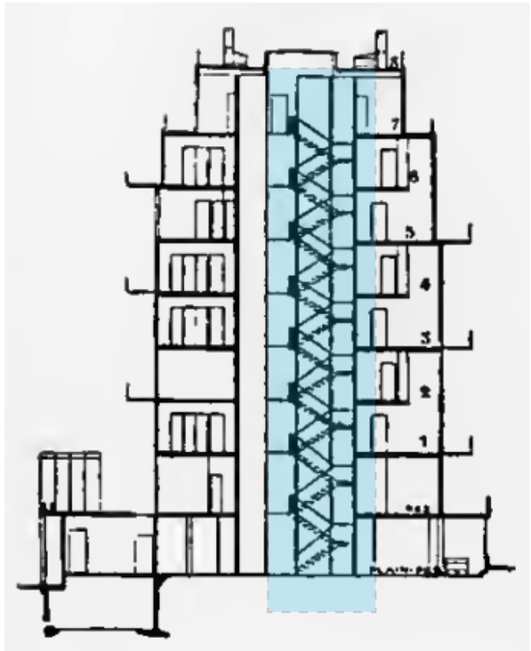


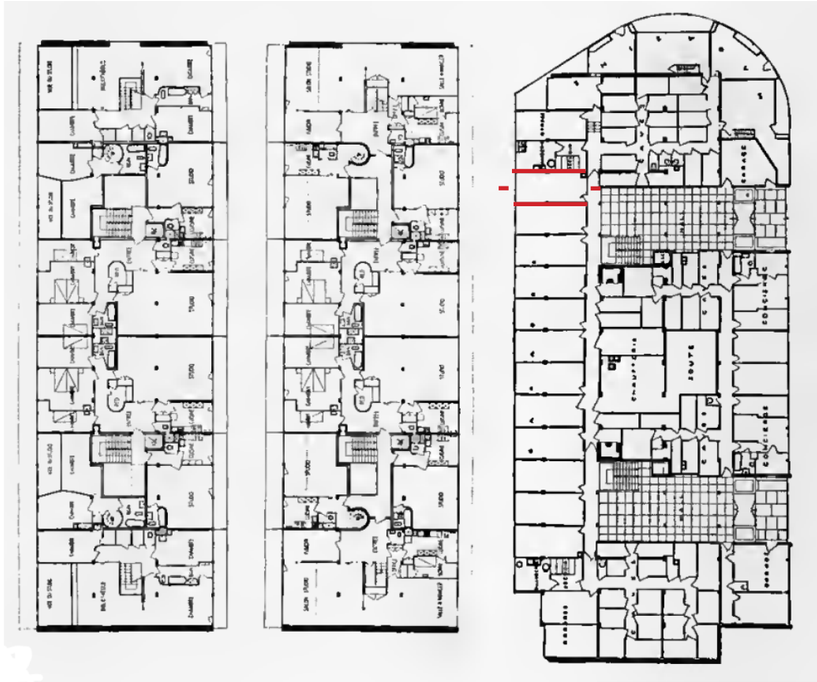
Double-loaded system; corridor every second floor.

Access

-Multiple Vertical Access

This is a system composed of vertical stacking of units/ floor plans. The vertical access core is typically centralized, or in the case of larger buildings, centralized between sets of around 6 units.





1: Sherwood, Roger. Modern Housing Prototypes. 1979

All base images sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 114-118

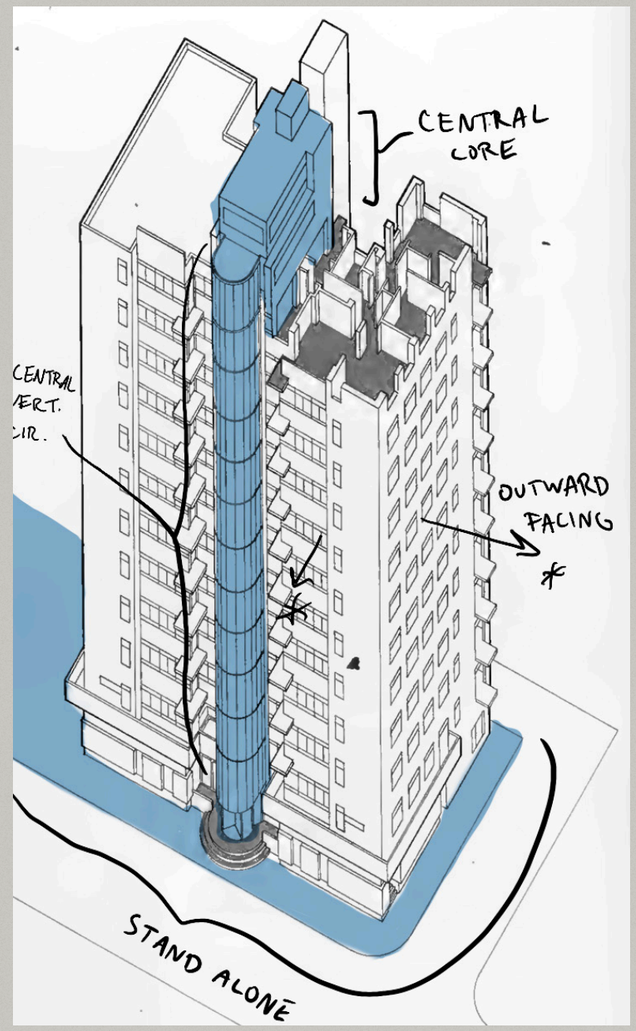
2.1.6.1 TOWERS

Victorieplein Tower

Amsterdam, 1929 | J.F. Staal

Buildings/homes atop of each other

Characteristics:
-Repeated Plans atop each other connected by vertical circulation
-Typically not attached to other buildings (see party-wall building for contrast)
-Vertical core
-Usually units within are arranged with symmetry
[1]



1: Sherwood, Roger. Modern Housing Prototypes. 1979

Base image sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 138

2.1.6.2 TOWERS

Units

-Single Orientation
A single-orientation unit opens/faces to one side.

Two types:
-core elements arranged **perpendicular** along transverse walls/corridor
-core elementsd arranged **adjacent/parallel** to walls/corridor

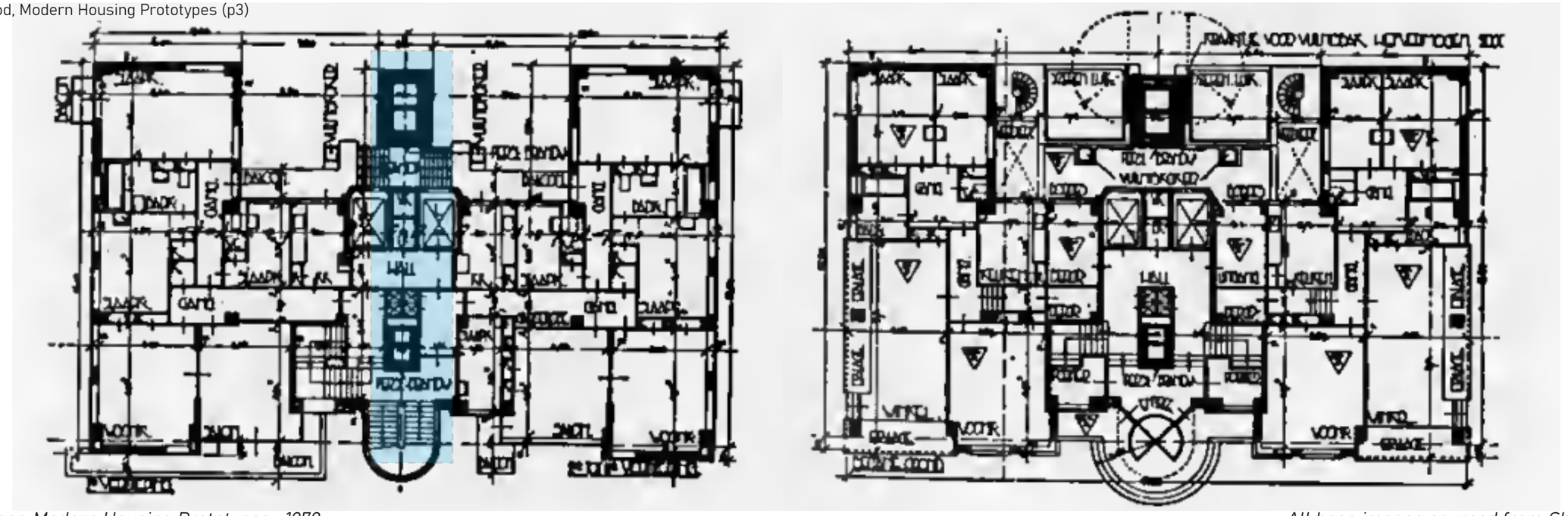
"Although these units have a preferred side—they face outward and are most often used where three sides are closed except for the entrance from the corridor (a typical double-loaded corridor arrangement)—some single-loaded, open gallery-access versions may have some minor windows opening to the gallery."
R. Sherwood, Modern Housing Prototypes (p3)

Circulation

Double-loaded system; corridor every floor.

Access

-Multiple Vertical Access
This is a system composed of vertical stacking of units/floorplans. The vertical access core is typically centralized, or in the case of larger buildings, centralized between sets of around 6 units.



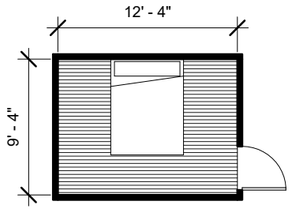
1: Sherwood, Roger. Modern Housing Prototypes. 1979

All base images sourced from Sherwood, Roger. Modern Housing Prototypes. 1979. p. 138-141

MAJOR FINDINGS: INTERIOR ASPECTS

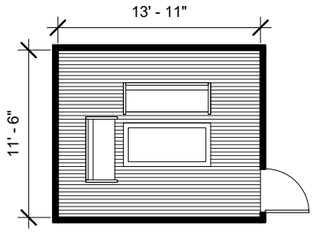
2.2 PROGRAMMATIC COMPONENTS & SIZING MINIMUMS

BEDROOM



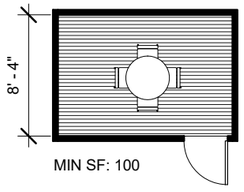
MIN SF: 120

LIVING ROOM



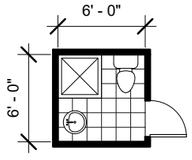
MIN SF: 160

DINING ROOM



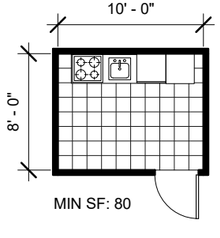
MIN SF: 100

FULL BATHROOM



MIN SF: 32

STAND ALONE KITCHEN



MIN SF: 80

a

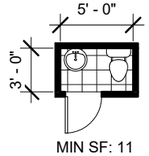
space[1]	min ar ft²					least dimension
	lu with 0 br	lu with 1 br	lu with 2 br	lu with 3 br	lu with 4 br	
lr	na	160	160	170	180	11′ 6″
dr	na	100	100	110	120	8′ 4″
br (primary)[2]	na	120	120	120	120	9′ 4″
br (secondary)	na	na	80	80	80	8′ 0″
total ar br	na	120	200	280	280	
ohr	na	80	80	80	80	8′0″

b

combined space [1]	min ar ft²					least dimension
	lu with 0 br	lu with 1 br	lu with 2 br	lu with 3 br	lu with 4 br	
lr-da	na	210	210	230	250	see note 3
lr-da-sl	250	na	na	na	na	
lr-da-k	na	270	270	300	330	
lr-sl	210	na	na	na	na	
k-da	100	120	120	140	160	

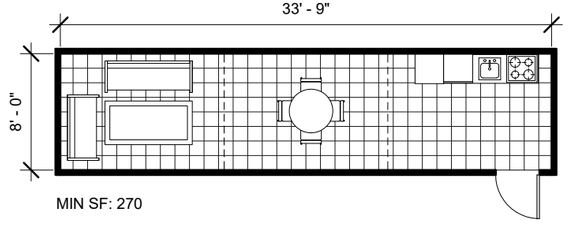
[1] abbreviations: br: bedr da: dining ar dr: dining rm k: kitchen lr: living rm lu: living unit na: not applicable 0 br: lu with no separate bedr ohr: other habitable rm sl: sleeping ar
[2] primary bedr shall have at least 1 uninterrupted wall space of at least 10′
[3] min dimensions of combined rm shall be sum of dimensions of individual single rm involved except for overlap or combined use of space

HALF BATHROOM



MIN SF: 11

COMBINED SPACE:
KITCHEN, LIVING, DINING

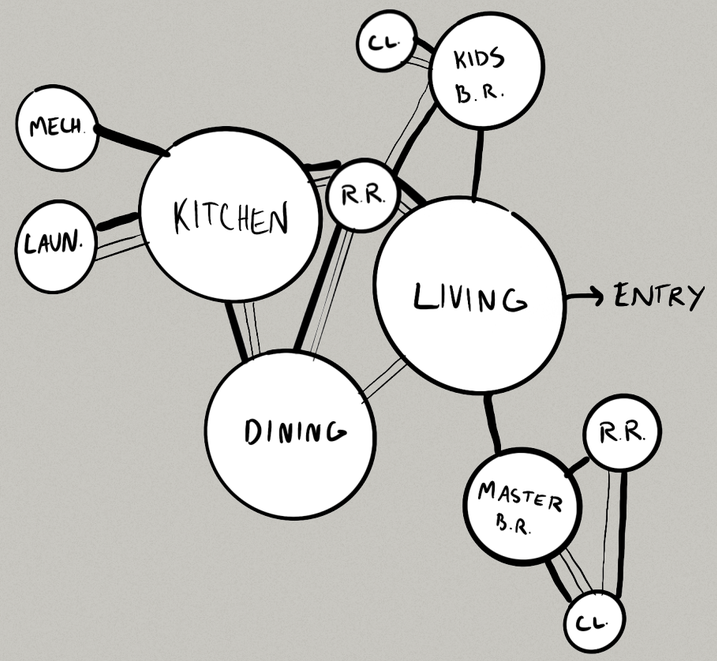


MIN SF: 270

Chart sourced from Ernst. Neufert Architects' Data. 1970. p. 44

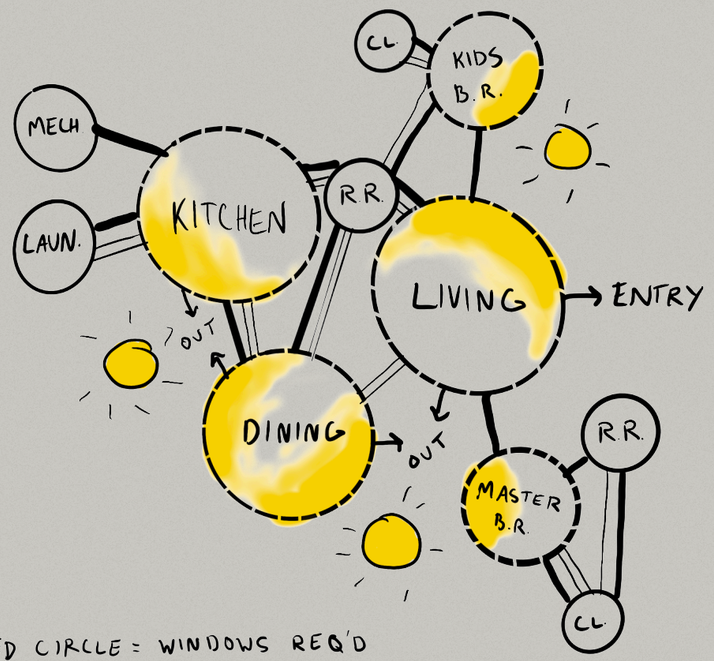
2.3 INTERIOR CONNECTIONS: WESTERN MODEL

Connection of Program



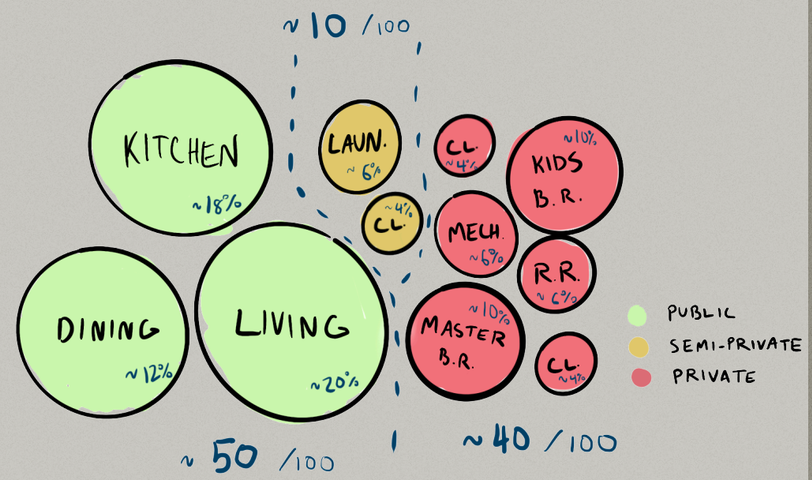
— INDIRECT CONNECTION
═ OPEN ATTACHMENT/OVERLAP
▬ DIRECT CONNECTION

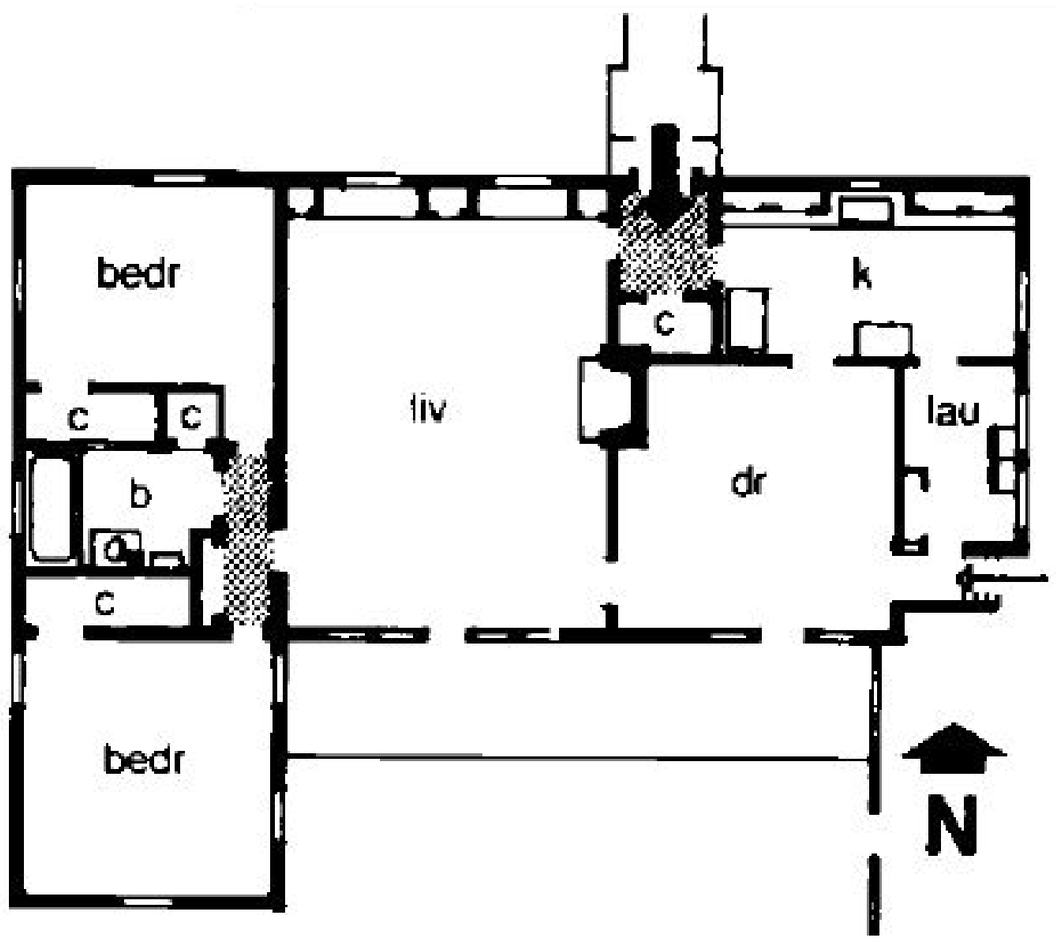
Program in relation to Light/Outside Access



DASHED CIRCLE = WINDOWS REQ'D
— INDIRECT CONNECTION
═ OPEN ATTACHMENT/OVERLAP
▬ DIRECT CONNECTION
● SUN / OUTSIDE PROXIMITY

Proportions in relation to Program & Privacy



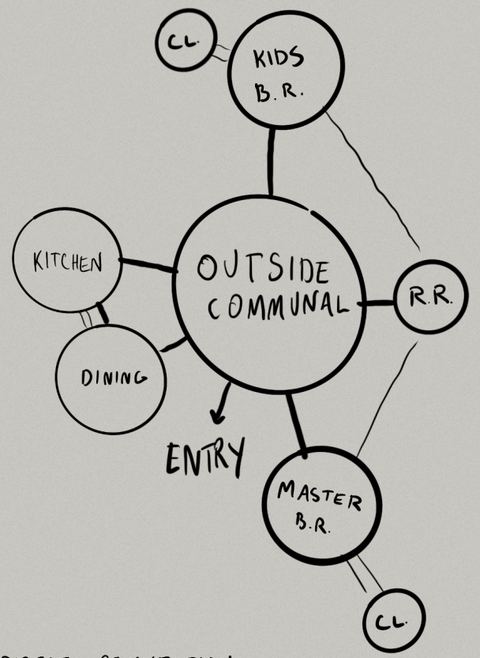


4 House in California USA with ter facing S & bathr between bedr
Arch Donald

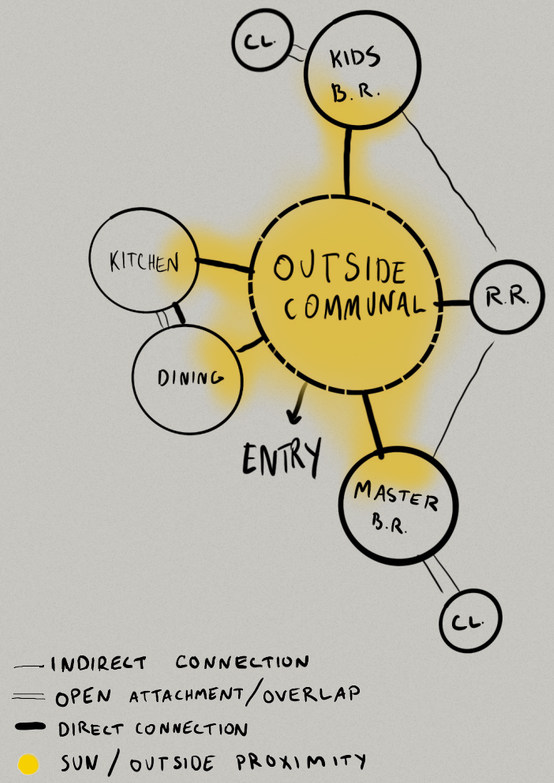
Neufert, Architect's Data, 1970. p. 51

2.4 INTERIOR CONNECTIONS: MIDDLE EASTERN MODEL

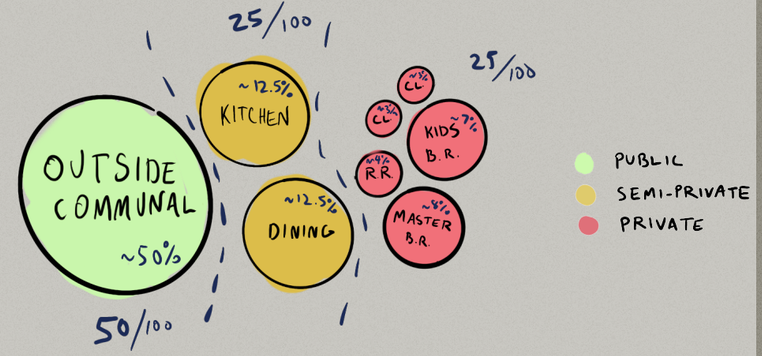
Connection of Program



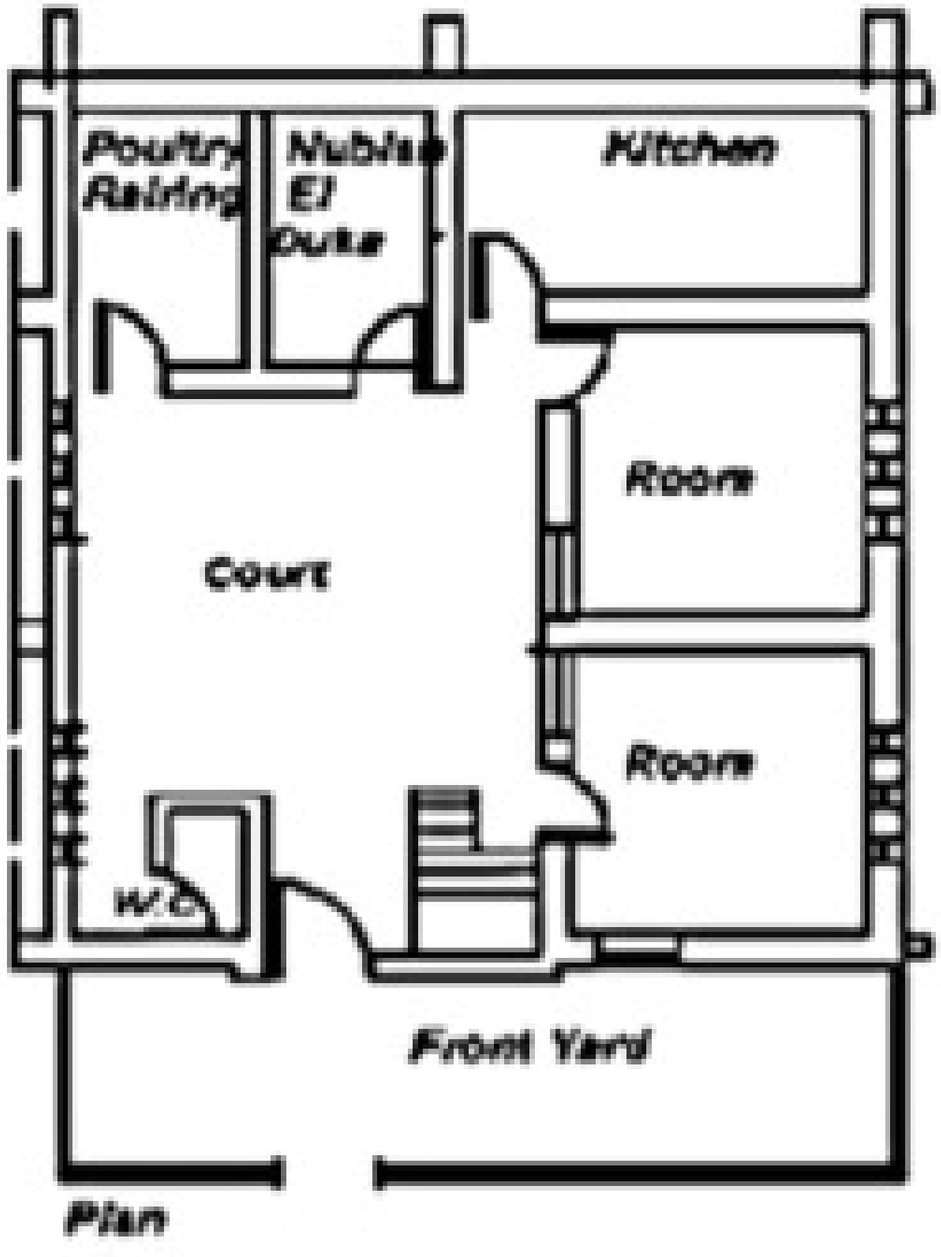
Program in relation to Light/Outside Access



Proportions in relation to Program & Privacy

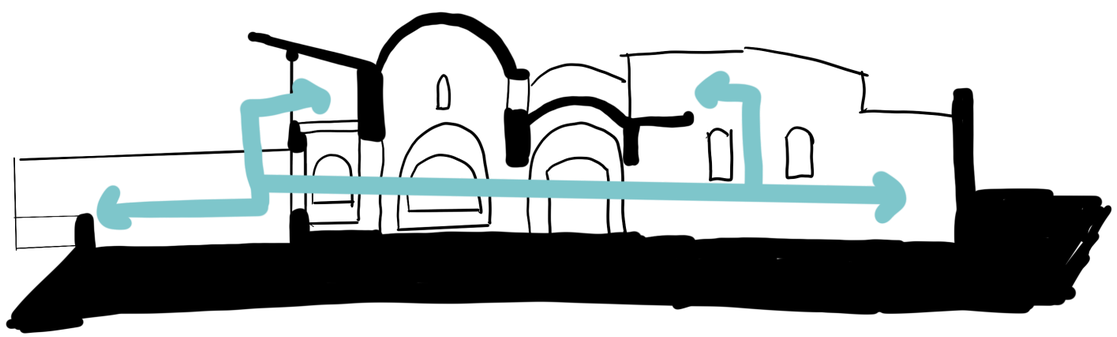


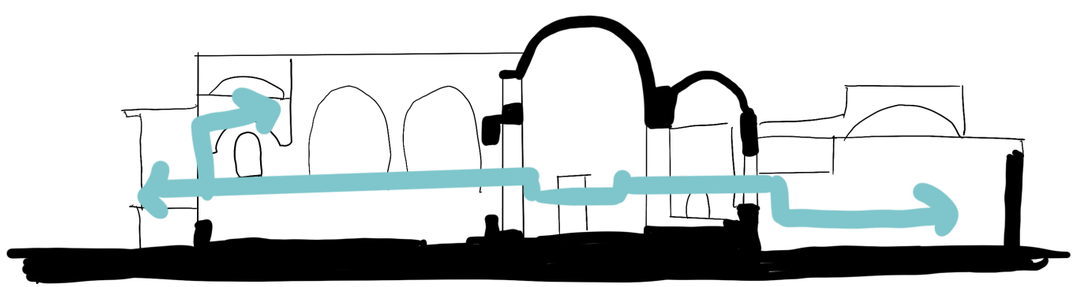
STANDARD FAMILY UNIT

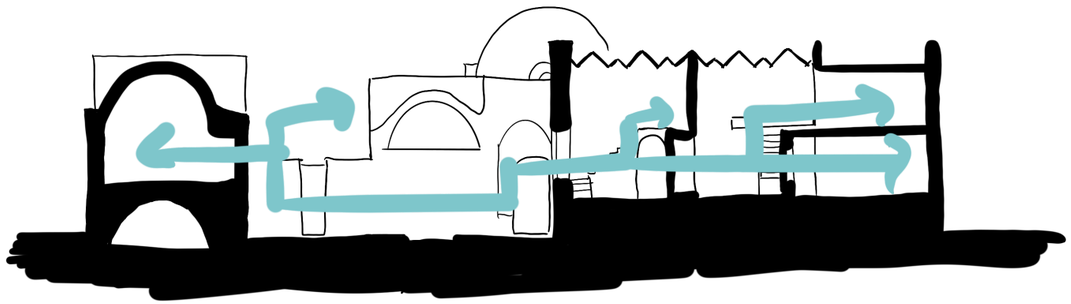


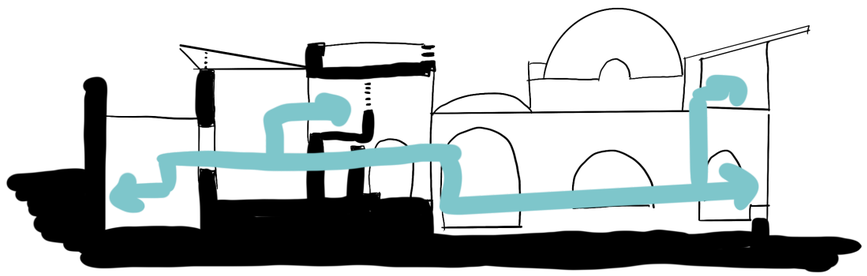
Plan

2.5.1 TRADITIONAL EGYPTIAN VERNACULAR STUDIES



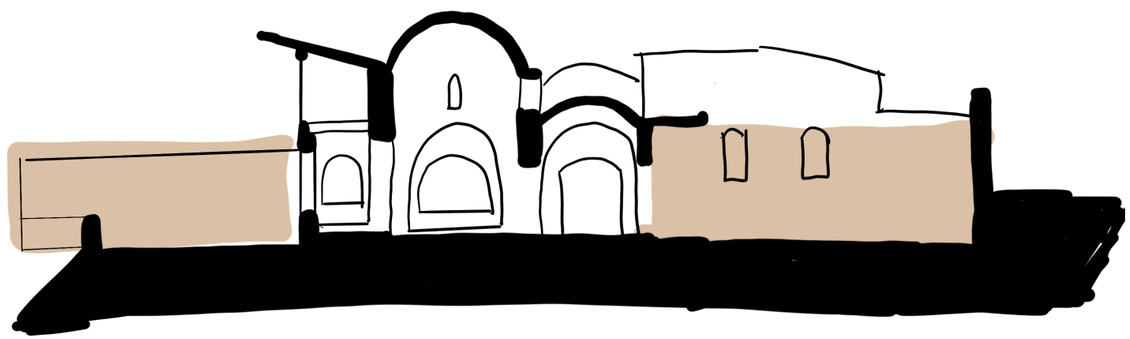


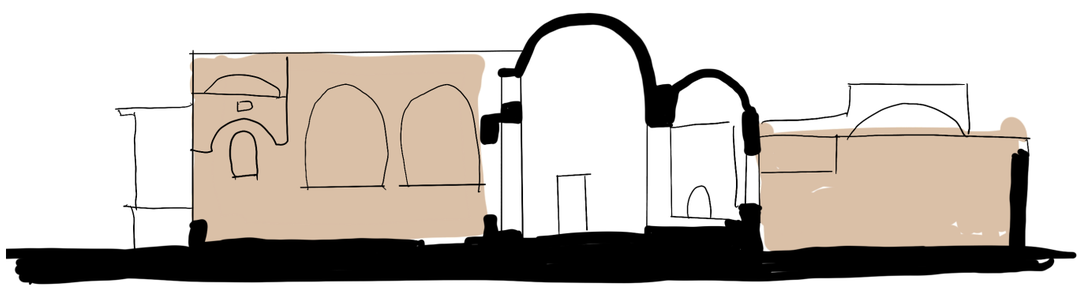


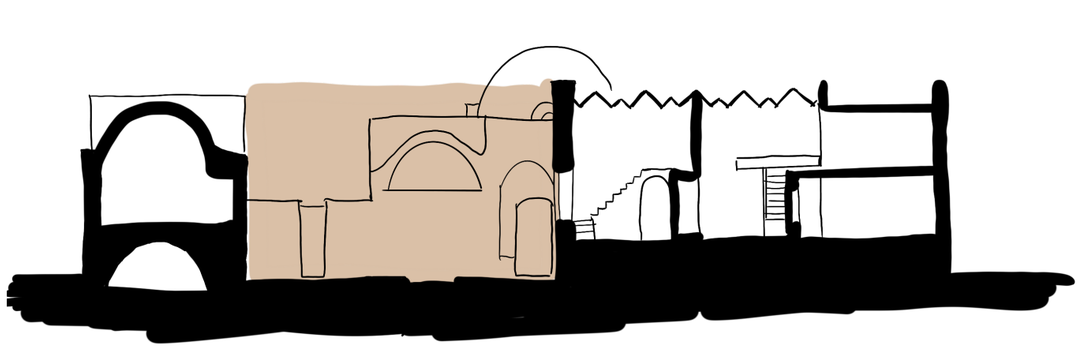


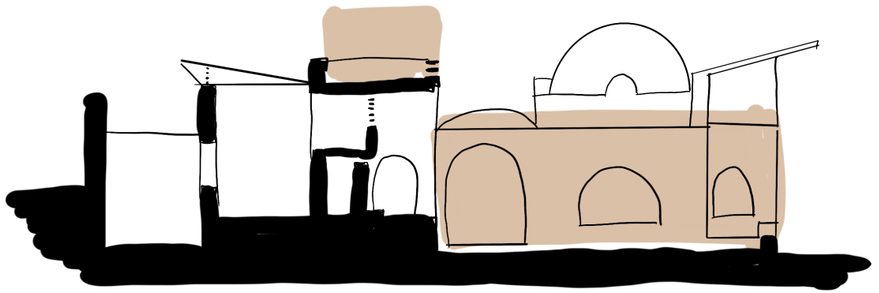
CIRCULATION

Designs by Hassan Fathy, *Architecture for the Poor: An Experiment in Rural Egypt*





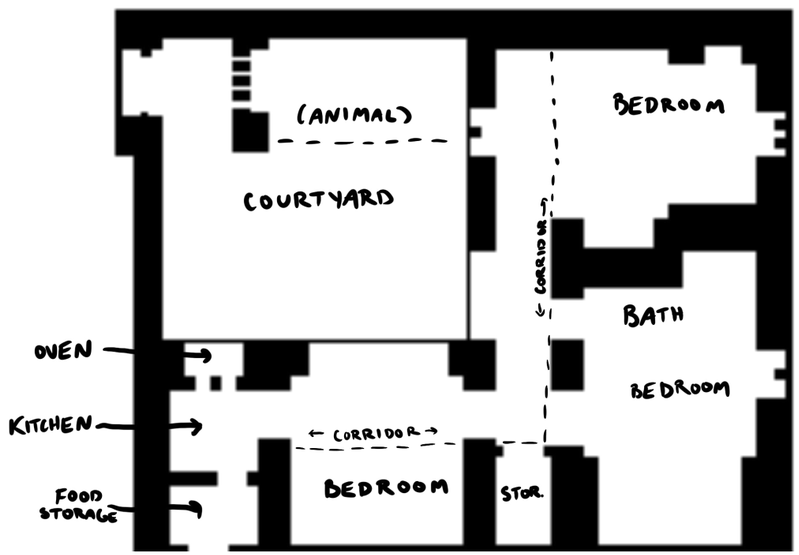


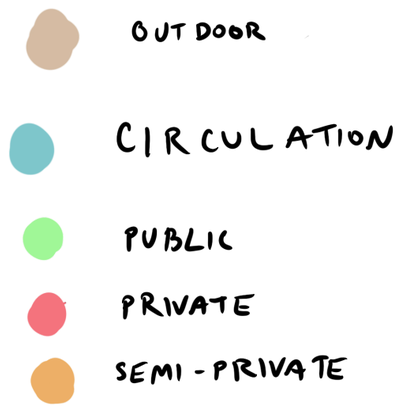


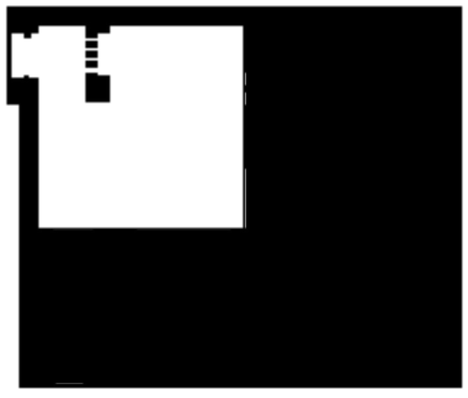
Designs by Hassan Fathy, *Architecture for the Poor: An Experiment in Rural Egypt*

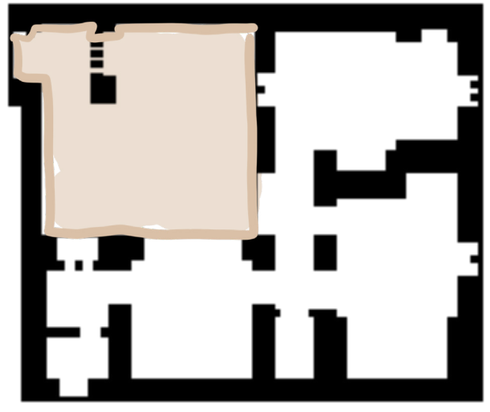
2.5.2 TRADITIONAL EGYPTIAN VERNACULAR STUDIES

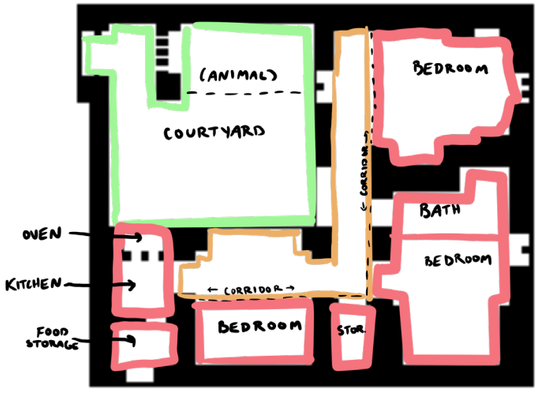
SINGLE-FAMILY/STORY

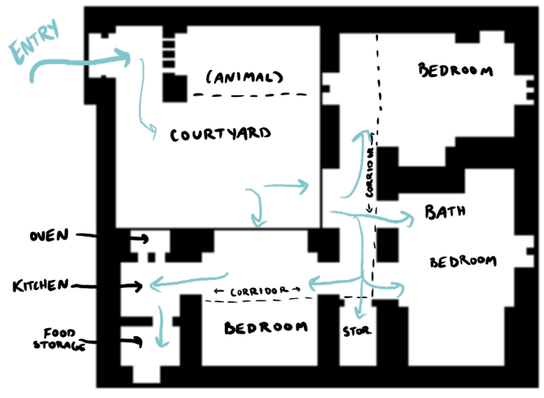






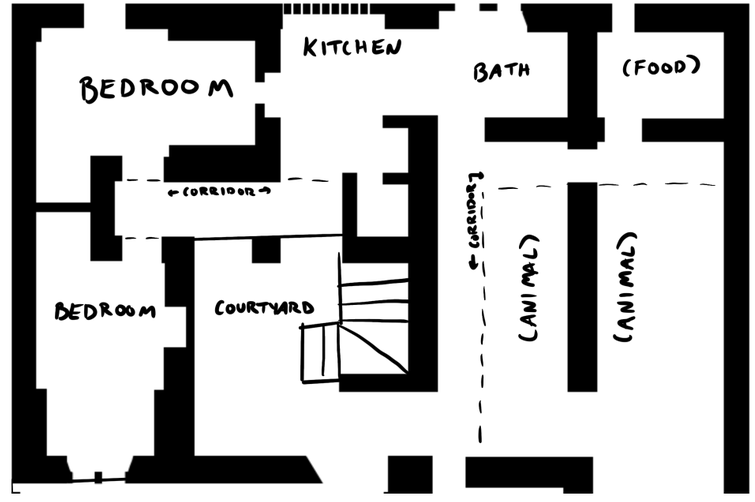


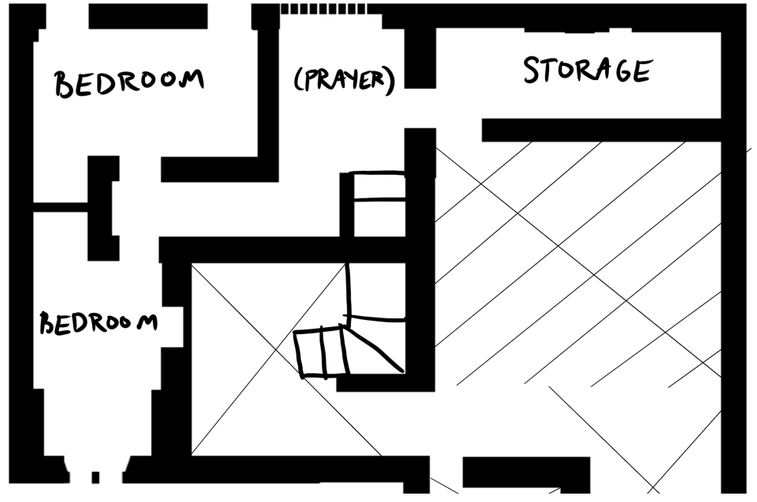




Designs by Hassan Fathy, *Architecture for the Poor: An Experiment in Rural Egypt*

GE/EXTENDED FAMILY-
2 STORY TERRACED





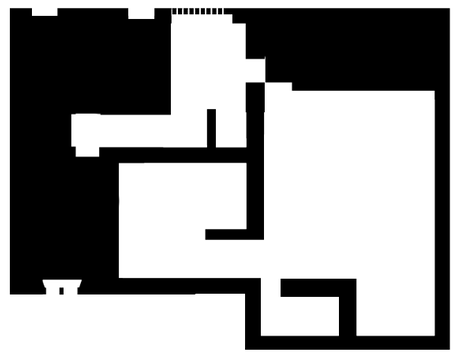
OUT DOOR

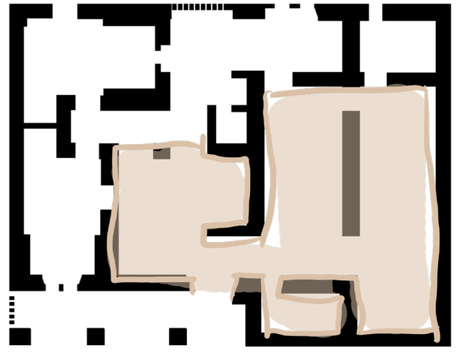
CIRCULATION

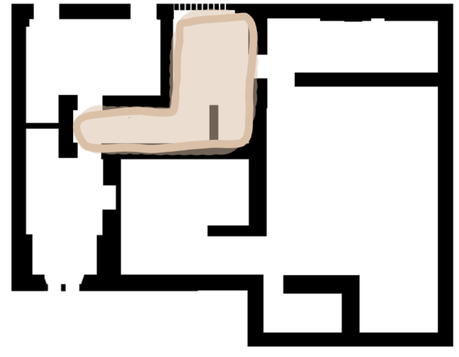
PUBLIC

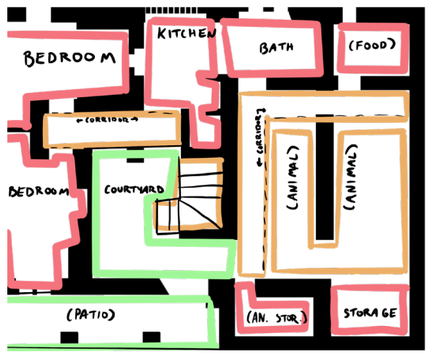
PRIVATE

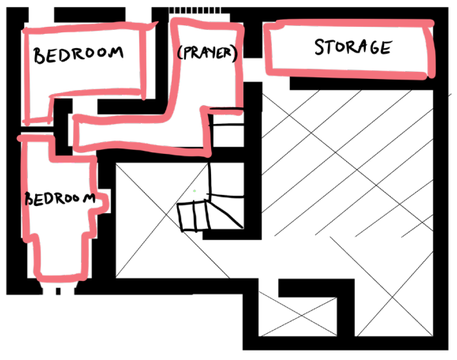
SEMI-PRIVATE

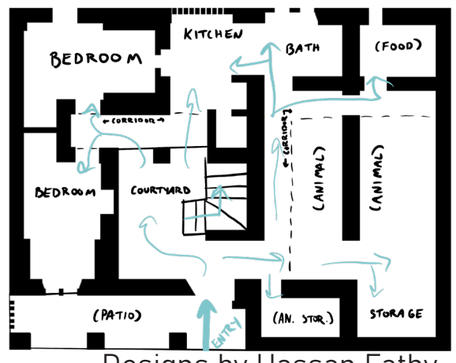


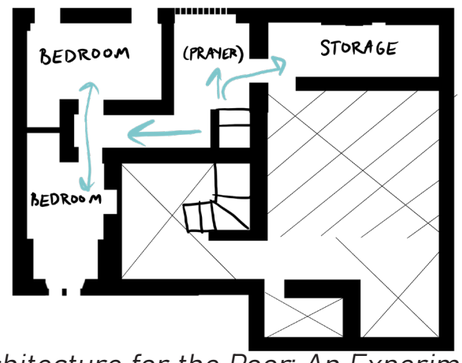












Designs by Hassan Fathy, *Architecture for the Poor: An Experiment in Rural Egypt*

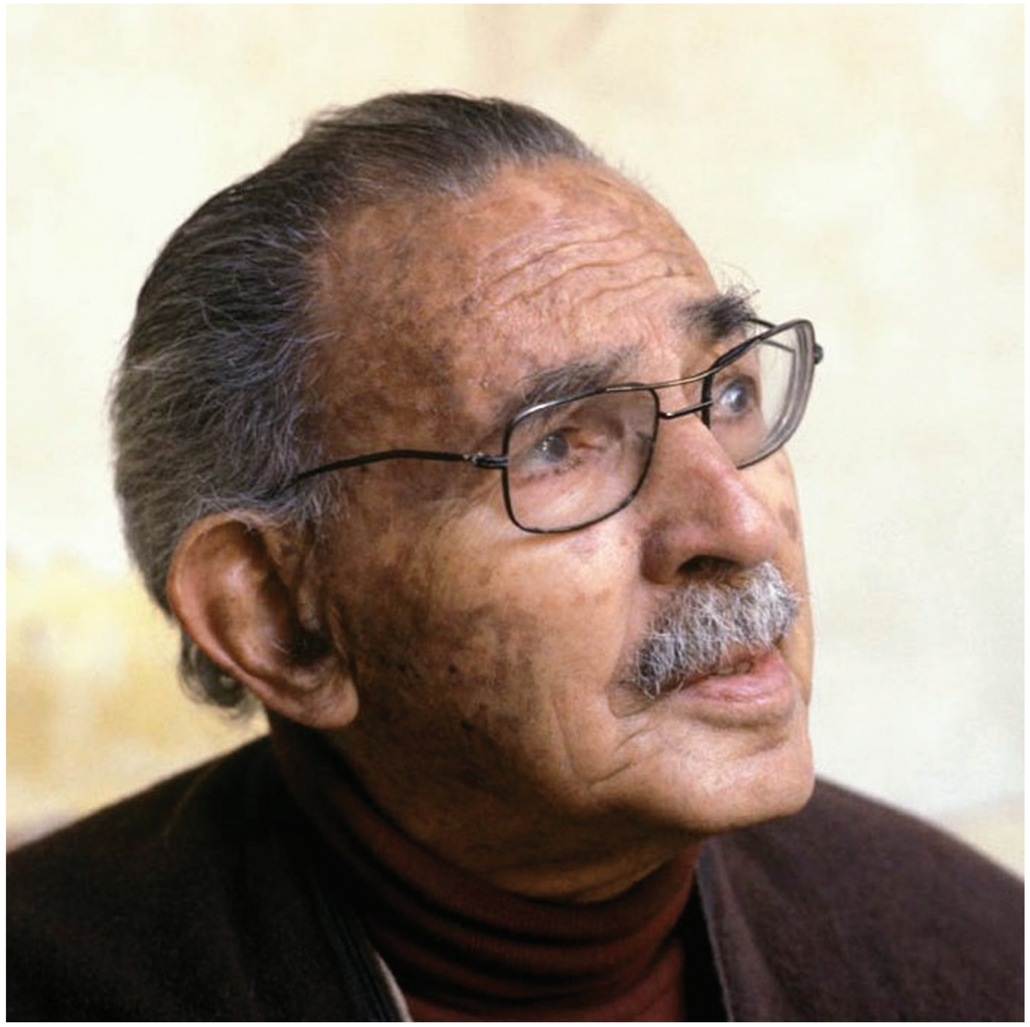
PRECEDENTS: IDEOLOGIES & STUDIES

2.6.1 IDEOLOGIES OF HASSAN FATHY

SIGNIFICANCE:

Hassan Fathy built the foundation of his architectural disposition since the beginning of his career, taking focus and studying Egypt's early architecture. He specifically studied their techniques in what would now be considered environmentalist qualities, though to the early architects of Egypt would just be known as the standard of building design. According to the Aga Khan Trust for Culture, "Two such systems dominated his thinking: the climatically efficient houses of Mamluk and Ottoman Cairo, ingeniously shaded and ventilated by means of their two-story halls, mashrabiyyas and courtyards; and the indigenous mud brick construction still to be found in rural areas. The latter consists of inclined arches and vaults, built without shuttering, domes on squinches built over square rooms in a continuing spiral, semi-domed alcoves and other related forms." [1]

According to Al Jazeera, "Hassan Fathy devoted himself to housing the poor in developing nations and deserves study by anyone involved in rural improvement."[2] He did so by using a combination of low-cost yet environmental strategies and indigenous+appropiate styles such as the latter mentioned ancient mud-brick construction. Along with creating this works on his own, he also taught the people living in the impovershed+rural areas of his design these strategies, and how to create for themselves. From this training, the inhabitents were about to create their own materials for their own buildings. Because the areas Fathy would design for were so impovershed, non-mechanical and inexpensive enviornmental strategies were incredibly important. A popular strategy among Fathy's designs is the use of courtyard spaces often surrounded by dense masonry walls. This strategy allowed for passive cooling, a must in the desert climate of most of Egypt.



https://www.arageek.com/bio/hassan-fathy

[1]: Aga Khan Award for Architecture, "Chairman's Award: Lifetime Achievements of Hassan Fathy" *https://www.akdn.org/our-agencies/aga-khan-trust-culture/aga-khan-award-architecture/1978-1980-cycle/chairmans-award*
[2] Al Jazeera, "Hassan Fathy: Efypt's architect of the poor" *https://www.aljazeera.com/features/2017/3/23/hassan-fathy-egypts-architect-of-the-poor*

2.6.2 NEW GOURNA VILLAGE

ARCHITECT: Hassan Fathy

LOCATION: Al Qarna, Egypt

SIGNIFICANCE:

This project recieved the Right Livelihood Award, exemplified as an "international award to 'honor and support those offering practical and exemplary answers to the most urgent challenges facing us today." [1] Hassan Fathy received this award in specific relation to his book, Architecture for the Poor. According to the section of the Aga Khan website detailing his award, they announce "with the publication of *Architecture for the Poor*, University of Chicago Press 1973, Fathy's work came to international attention. This book, which has since become a classic, describes in detail Fathy's experience in planning and building the village of New Gourma, using mud bricks and employing traditional Egyptian architectural features, such as enclosed courtyards and domed and vaulted roofing. Fathy worked closely with the people to tailor his designs to their needs. He taught them how to work with the mud bricks, supervised the erection of buildings and encouraged the revival of ancient decorative techniques." [2] This award was also received in reference to the project that granted him his previously mentioned other two awards (Aga Khan, Balzan): New Gourna Village. New Gourna Village is arguably one of Fathy's most well known projects, alongside his book. Together, both of these pieces have caused a shift towards using ancient methods in design in modern day Egypt, due to the exposure they provided from their successes.

Original Plan for New Gourna Village, Luxor — MIT Library

What remains of New Gourna Village, Luxor — Tourist Photo sourced from Trip Advisor

1: The Right Livelihood Award "Hassan Fathy" *https://www.rightlivelihoodaward.org/laureates/hassan-fathy/*
2: Ministry for Foreign Affairs, 2013. "The 2013 Right Livelihood Laureates announced" *https://web.archive.org/web/20140303235727/http://www.government.se/sb/d/17191/a/225032*

2.6.3 THE BETTER SHELTER

SIGNIFICANCE:

Also known as the "IKEA Flat Pack Shelter," an innovative modular shelter system has been devised by the partnering UN Refugee Agency (UNHCR) and the IKEA Foundation. According to bettershelter.org, the operation provides "ready-made shelter solutions for projects and operations where locally-sourced materials are scarce." [1] A large part of the operation is focused on innovation through design stategies in order to meet the fluctuatining needs of communities in poor conditions. Shelters are made in order to stand site specific conditions and are tested through context, climate, and application.

Multiple operations of the Better Shelter project have been rolled out in a number of locations. Each of these locations have undergone trials through either natural disaster, political distruction, or poverty. These locations* include but are not limited to areas within:

-Angola, area in conflict
-Mexico, area in conflict
-Peru, area struck by disaster
-Senegal, areas devastated by climate change and underdevelopment
-Nepal, area struck by disaster
-Botswana, area struck by underdevelopment
-Bangladesh, area struck by underdevelopment
-Djibouti, area struck by conflict
-Iraq, areas struck by conflict
-Syria, areas struck by diseased perpetuated from conflict

Materials used to create these shelters use minimal and easy to transport options. This includes treated polyolefin foam panels for walls and roofs, galvanized steel for framing and foundation, stabilized and resistant polymer plastic for doors/windows/smaller components, and woven polyethylene fibers for the floors. [3] All these components can be put together to constuct the modular system using simple steel tools, also included with the shelter.

**A full list can be found on bettershelter.org/where-we-work/*

1: "Better Shelter 1.2 - Product Specification" Better Shelter, https://bettershelter.org/wp-content/uploads/2018/09/Better-Shelter-1.2-Product-Specification.pdf.

Flat Pack Shelter, *bettershelter.org/where-we-work/*

2.6.4 PLAYGROUNDS FOR REFUGEE CHILDREN

ARCHITECTS: CatalyticAction

LOCATION: Bar Elias, Lebanon

SIGNIFICANCE:

When designing shelter for impovershed communities, the design of the shelter itself is not the only aspect contributing to the community's success. Successful communitues gain much of their success in having strong bonds and ties to others. Communal spaces must be considered when creating sheltering spaces and homes. The playgrounds for refugee children in Bar Elias, Lebanon, create a safe space for children to escape and grow bonds with each other. Designed for the children of Syrian refugees finding asylum in Lebanon, community involvement of refugees took part in the creation of these community spaces. The playgrounds were designed to engage refugees and the creation of something positive. The structure of the playgrounds were made to be easily disassembled/reassembled, easily transported, and easily repurposed. These elements contribute to the success of impovershed communities, allowing room for them to grow and idealy relieve themselves of poverty. Children were even involved in the process of design of these playgrounds, giving psychological and communal nourishment to their developing minds.
[1]

Franco, Jose Tomas. "CatalyticAction Designs Playgrounds for Refugee Children *www.archdaily.com/778318/catalyticaction-designs-playgrounds-for-refugee-children-as-emergency-response-in-bar-elias-lebanon.*

1: Franco, Jose Tomas. "CatalyticAction Designs Playgrounds for Refugee Children *www.archdaily.com/778318/catalyticaction-designs-playgrounds-for-refugee-children-as-emergency-response-in-bar-elias-lebanon.*

2.6.5 MUD BRICK CONSTRUCTION OF TIMBUKTU

ARCHITECTS: Compilation of African Architects, Notably Abu Es Haq Es Sahel

LOCATION: Timbuktu, Mali

SIGNIFICANCE:

The architecture of Timbuktu is notable in its mud-brick construction, which uses both local resources and passive cooling methods. These methods take advantage of the exteme desert climate and make the most out of the limited resources availible. This method of construction is also known as “earthen architecture.” The process of construction typically goes as followed:

Wet soil is applied by layer on to either rocks (often limestone) or bricks made from the same soil, dried. After these bricks are established into the desired form, another layer of the wet soil is applied to the exterior as a finishing element. Larger structures are reinforced much like how concrete is reinforced with rebar. Though, instead of metal that would be used in concrete, wooden stakes are used. The wooden stakes hold enough structural stability for the relatively lightweight bricks constructed from the mud.

Construction methods such as the one explored may be incredibly useful for areas where building resources are scarce, using the limited natural surroundings to advantage. [1]

Smith, Alex Duval. “Timbuktu’s Djinguereber Mosque: a History of Cities in 50 Buildings, Day 5.”
www.theguardian.com/cities/2015/mar/27/timbuktu-djinguereber-mosque-history-cities-buildings.

1: Kamiya, Takeo. “ISLAMIC ARCHITECTURE in MALI, West Africa
http://www.kamit.jp/27_mali/mal_eng.htm

2.7.1 PRECEDENT STUDIES: QUINTA MONROY

ELEMENTAL HOUSING

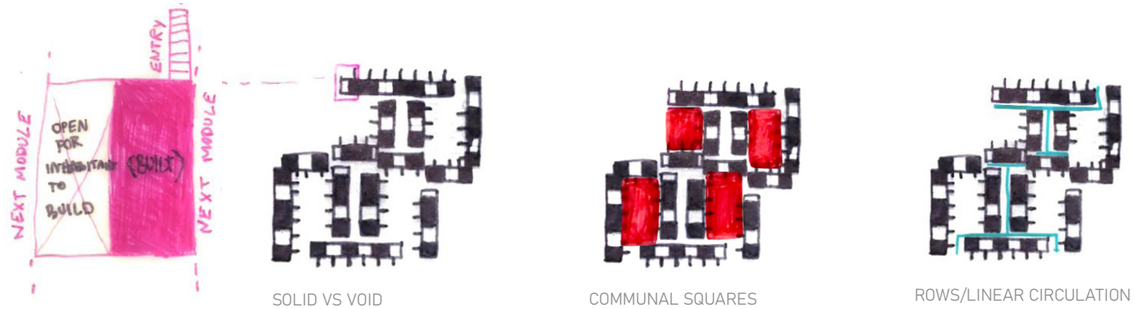
Base image sourced from "Half A House Builds A Whole Community: Elemental's Controversial Social Housing"
https://www.archdaily.com/797779/half-a-house-builds-a-whole-community-elementals-controversial-social-housing

Cluster housing built using scarce available materials, each unit configuration built on its own plot to allow for expansion.

Allows for:
-Shared community space
-Basic needs/foundation provided
-Autonomy of inhabitant through individual “plots”
-Growable permanence
-Design within scarcity

Cons:
-Many won’t want to live in something “unfinished”
-Requires the inhabitant to invest in home/put in work
-Limits the impoverished to a district

SITE/COMPLEX (LARGE SCALE)

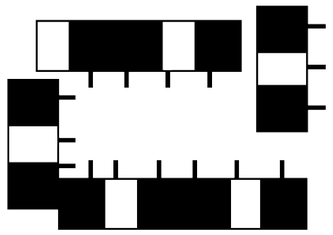


SOLID VS VOID

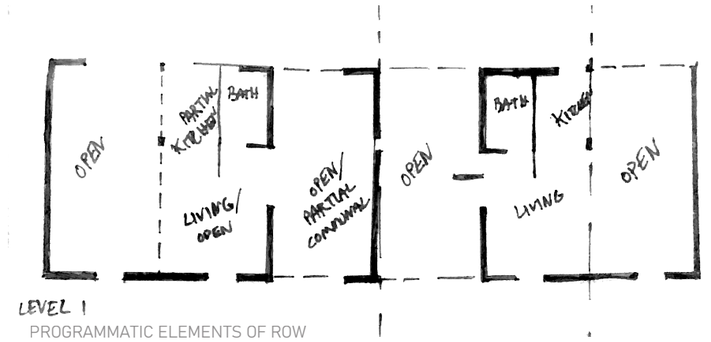
COMMUNAL SQUARES

ROWS/LINEAR CIRCULATION

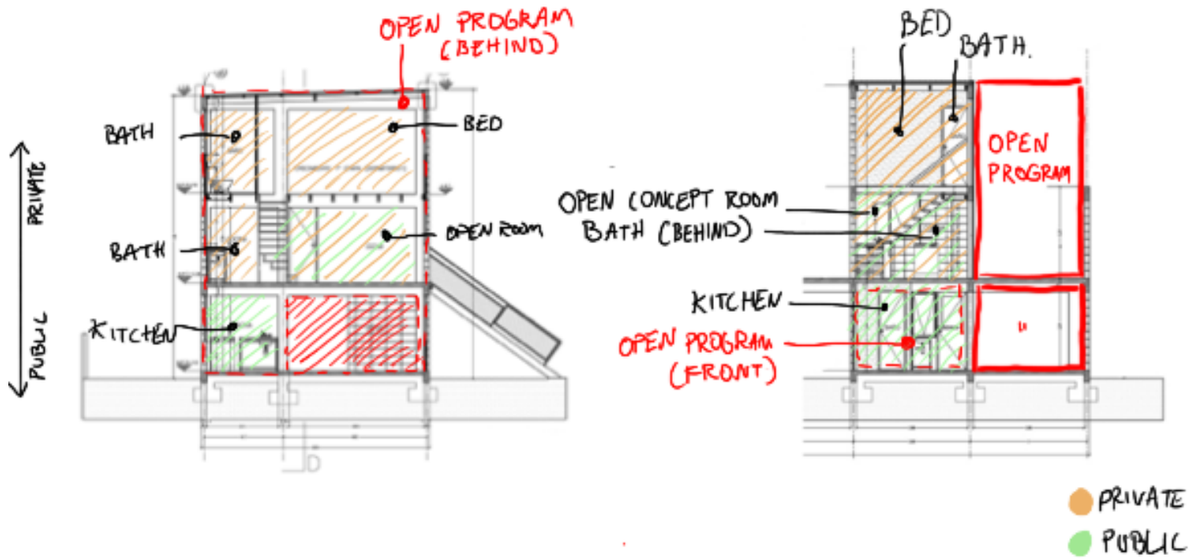
CLUSTER TO UNIT(MEDIUM TO SMALL SCALE)



SINGLE CLUSTER SHOWING ACCESS



PROGRAMMATIC ELEMENTS OF ROW



Base image sourced from “Half A House Builds A Whole Community: Elemental’s Controversial Social Housing” https://www.archdaily.com/797779/half-a-house-builds-a-whole-community-elementals-controversial-social-housing

2.7.2 PRECEDENT STUDIES: VILLA VERDE
ELEMENTAL HOUSING

Base image sourced from "Monterrey Housing / ELEMENTAL"
https://www.archdaily.com/52202/monterrey-housing-elemental

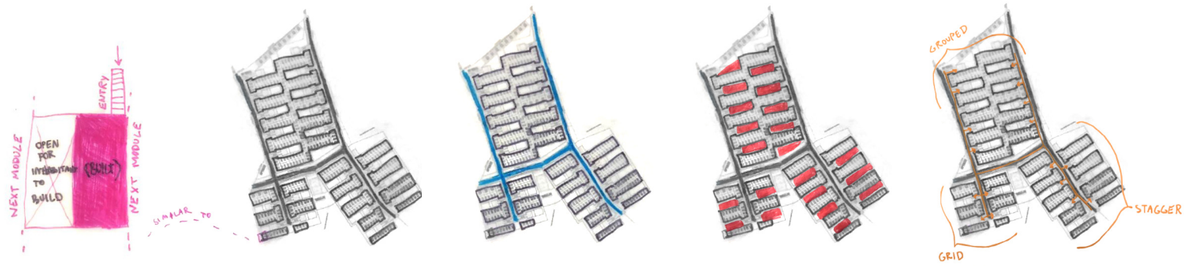
By building a sound foundation and “base,” inhabitants are able to continue construction using available materials.

This creates for a limited number of designs to be transformed into individualized pieces, tailored to those who live within.
This could be equated to a formula, with “x” being the inhabitant. The result changes depending on the “x.”

Allows for:
-Community involvement
-Basic needs/foundation provided
-Autonomy of inhabitant (doesn’t seem so much of a “handout” but rather a project to grow
-Eventual permanence
-Individuality
-Design within scarcity

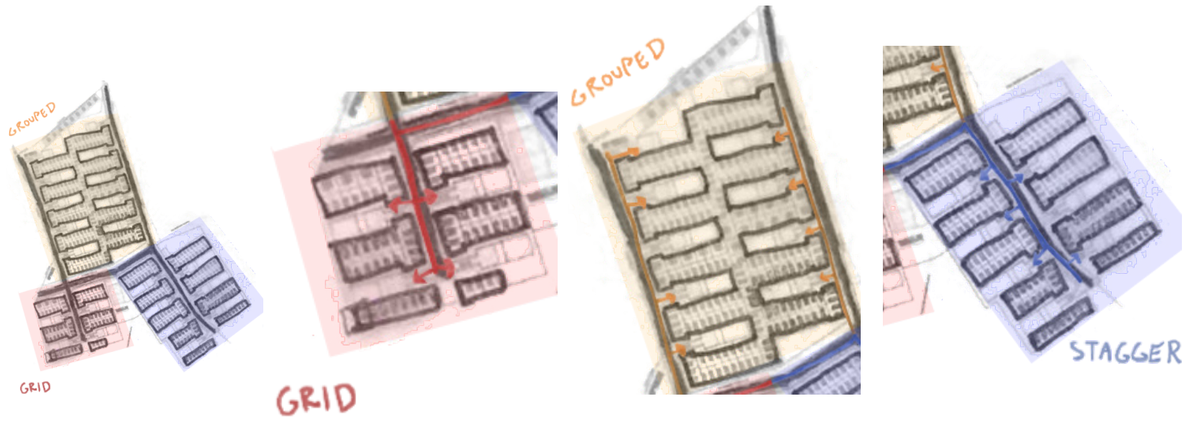
Cons:
-Many won’t want to live in something “unfinished”
-Requires the inhabitant to invest in home/put in work
-Limits the impoverished to a district
-Somewhat “institutional”

SITE/COMPLEX (LARGE SCALE)

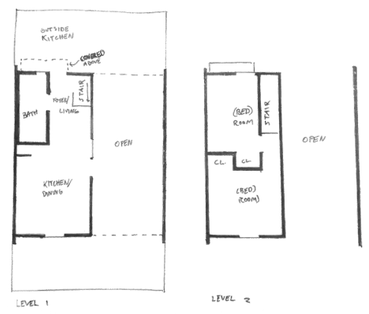


SOLID VS VOID | “NEIGHBORHOODS” | COMMUNAL SPACE | CONNECTION

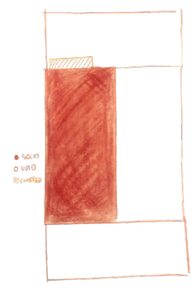
CLUSTER TO UNIT(MEDIUM TO SMALL SCALE)



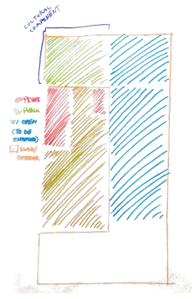
NEIGHBORHOOD TYPES/LAYOUTS



UNIT PROGRAM ELEMENTS



SOLID VS VOID (SMALL SCALE)



PUBLIC VS PRIVATE

Base images sourced from “Monterrey Housing / ELEMENTAL”
https://www.archdaily.com/52202/monterrey-housing-elemental

2.7.3 PRECEDENT STUDIES: **BELAPUR HOUSING**

CHARLES CORREA

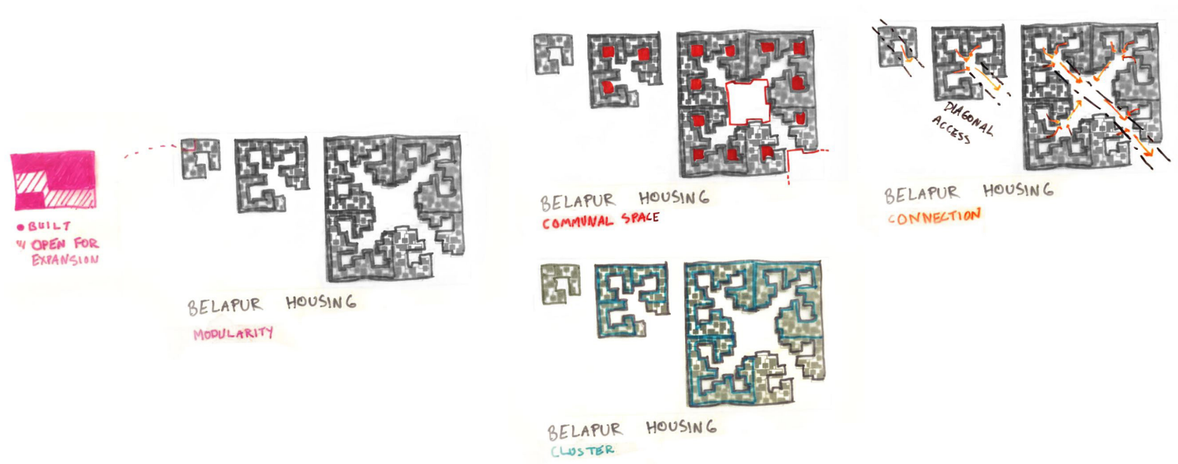
Base image sourced from "Belapur Housing"
https://architectopedia.com/belapur-housing-by-charles-correa-case-study/

Cluster housing built using scarce available materials, each unit configuration built on its own plot to allow for expansion.

Allows for:
-Shared community space
-Basic needs/foundation provided
-Autonomy of inhabitant through individual “plots”
-Growable permanence
-Design within scarcity
-Community development through shared clusters
-Individualized space dependent on needs
-Sense of privacy from small clusters of units

Cons:
-Many won’t want to live in something “unfinished”
-Requires the inhabitant to invest in home/put in work
-Limits the impoverished to a district

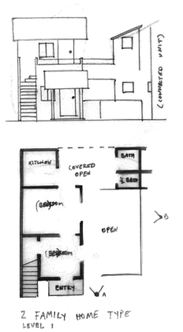
SITE/COMPLEX (LARGE SCALE)



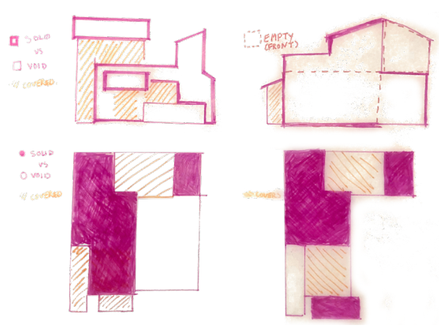
CLUSTER TO UNIT(MEDIUM TO SMALL SCALE)

CLUSTER MODULARITY FIGURE GROUND
DISPLAYS SOLID VS VOID (MEDIUM SCALE)

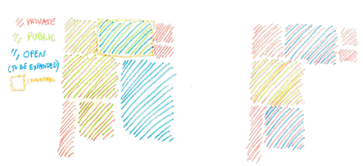
SINGLE CLUSTER



UNIT PROGRAM ELEMENTS



SOLID VS VOID (SMALL SCALE)



PUBLIC VS PRIVATE

Base images sourced from “Belapur Housing” https://architectopedia.com/belapur-housing-by-charles-correa-case-study/

2.8 NON-CONVENTIONAL AFFORDABLE HOUSING PROTOTYPES

Compact Housing

- Accessory Dwelling Units

- A dwelling unit on the lot of a single family home which is similar to the single-family home, but much smaller/compact
- Sustainability:
    - Built using traditional construction methods, meaning long lasting as compared to models of temporary shelter/housing
    - Makes use of underutilized land
- Cost: Highly variable depending on location/conditions, averages around $70k
    - Typically a fraction of the cost of a traditional single-family home, as it is within the same property & much smaller
- Pros:
    - Able to use underutilized/extra land already in possession of a home
    - Provides privacy
    - Creates community through neighborhoods
    - Provides opportunity for intermingling of different socio-economic classes
- Challenges:
    - Creates traffic/parking issues (when additional vehicles are present)
    - Political opposition
    - Limited capacity
    - Hard to accomplish in already dense areas

-Tiny Homes

- Similar to an accessory dwelling unit, though on its own land. A much smaller/ compact version of a single family home
- Sustainability:
    - Built using traditional construction methods, meaning long lasting as compared to models of temporary shelter/housing
    - Makes use of underutilized land, using very small plots
    - Material can be easily transported, oftentimes all being able to fit in one shipping container
- Cost: Highly variable depending on location/conditions, averages around $70k
    - Typically a fraction of the cost of a traditional single-family home
- Pros:
    - Able to use underutilized/extra land already in possession of a home
    - Provides privacy
    - Creates community through neighborhoods
    - Provides opportunity for intermingling of different socio-economiC classes
    - Easier to accomplish in already dense areas due to limited space usage
- Challenges:
    - -Limited capacity

-Micro Apartments

- A private micro-unit belonging to a network of other units with limited space/personal amenities
- Sustainability:
    - Small space makes for less cost for utilities
    - Can be created in repurposed/vacant buildings that were once hotels, dormitory buildings, offices, apartments, etc.
    - Reduces cost by centralizing amenities
    - Provides opportunity for life in more affluent areas due to reduced cost based on limited space
    - Density creates walkability (to an extent)
- Cost: Variable based on location/size, typically scaled higher based off location
- Pros:
    - Centralized amenities
    - Creates community through network of other units
    - Opportunity for intermingling between different socioeconomic classes
- Challenges:
    - Higher costs make them less accessible
    - High initial building/refitting costs

"Housing Typologies Toolkit" USC. https://homelessness.usc.edu/wp-content/uploads/sites/2/2019/09/USC-Housing-Typologies-Toolkit-R7-1.pdf

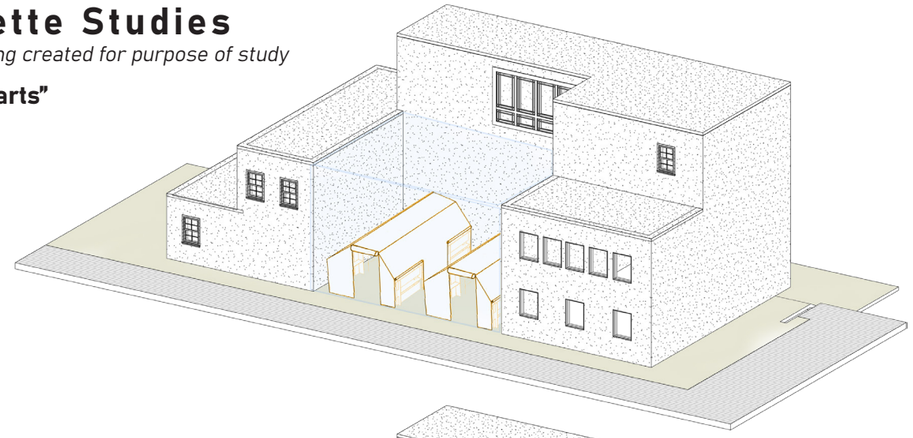
Innovative Use of Material

- **Temporary Sprung Structure for “Bridge” Shelter**
    - Temporary shelters like tents, using materials such as fabric, tension cables, etc. These shelters are used as a “bridge” shelter between relocating to a different or more permanent shelter
    - Sustainability:
        - Living wise: Not too sustainable due to the temporary nature
        - Construction wise: Materials can be reused, providing a sustainable aspect. Easy/fast construction times and methods also create for a sustainability aspect.
    - Cost: Very inexpensive, scaling up as more materials are needed or interior spaces become more elaborate
    - Pros:
        - Quickly gets people off the streets
        - Provides a safe shelter/space to those without one at all
        - Able to build quickly
        - Able to build in areas that do not accommodate the means for traditional building
- Challenges:
    - Temporary structure, limited stay time
    - Simple and often lacks privacy
    - Possibility to be disconnected from basic services such as water/plumbing

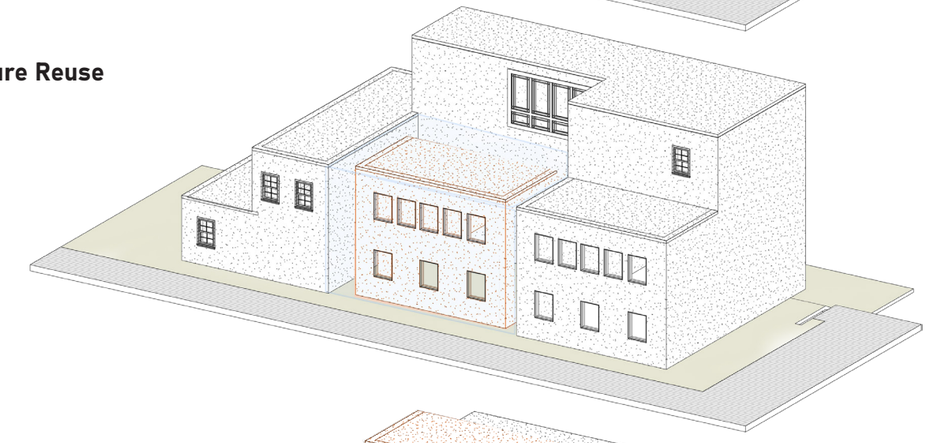
Charette Studies

Mock building created for purpose of study

- **“Kit of Parts”**



- **Structure Reuse**

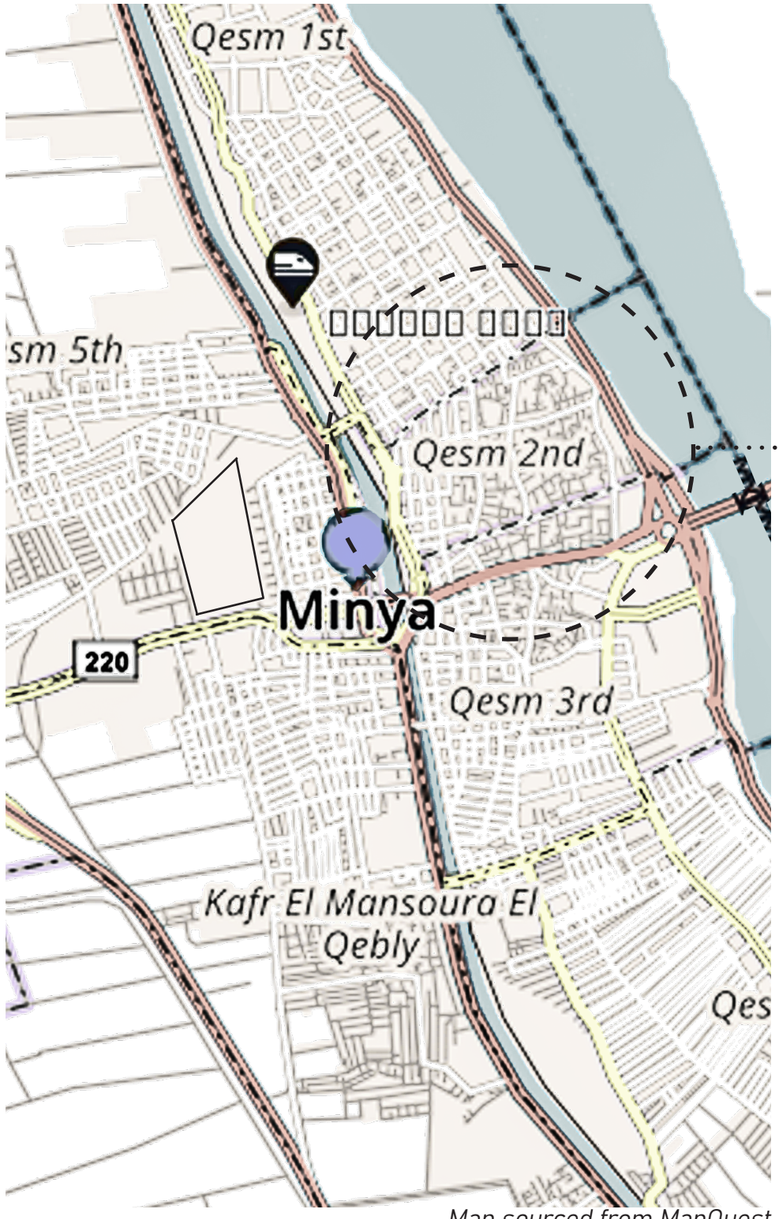


- **Multifamily Development**

“Housing Typologies Toolkit” USC. https://homelessness.usc.edu/wp-content/uploads/sites/2/2019/09/USC-Housing-Typologies-Toolkit-R7-1.pdf

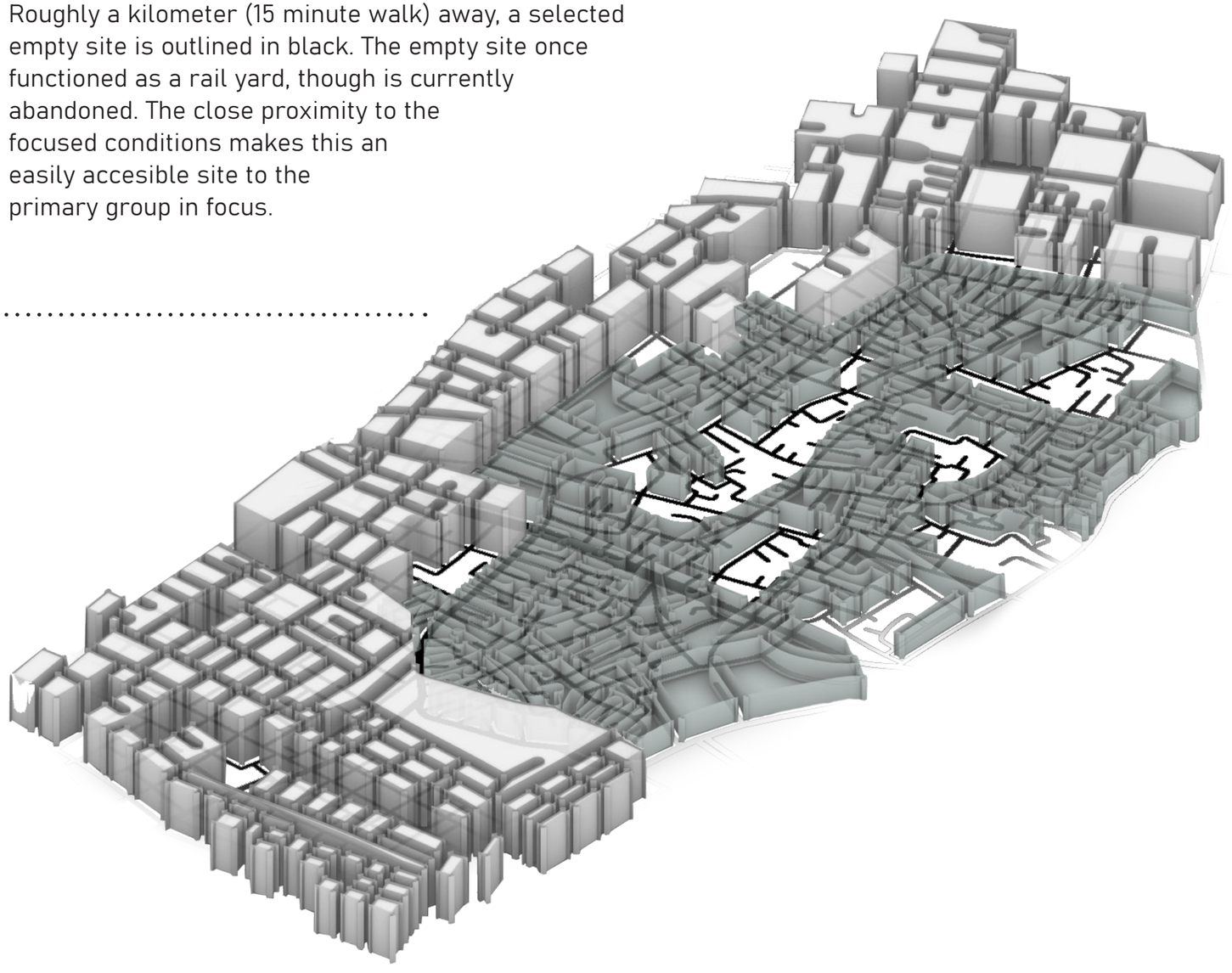
SECTION 3: **SITE**

3.1 SITE



Map sourced from MapQuest

Circled and expanded is the largest collection of “slums” in Minya, created through the occurance of diffuse urbanism. Roughly a kilometer (15 minute walk) away, a selected empty site is outlined in black. The empty site once functioned as a rail yard, though is currently abandoned. The close proximity to the focused conditions makes this an easily accesible site to the primary group in focus.



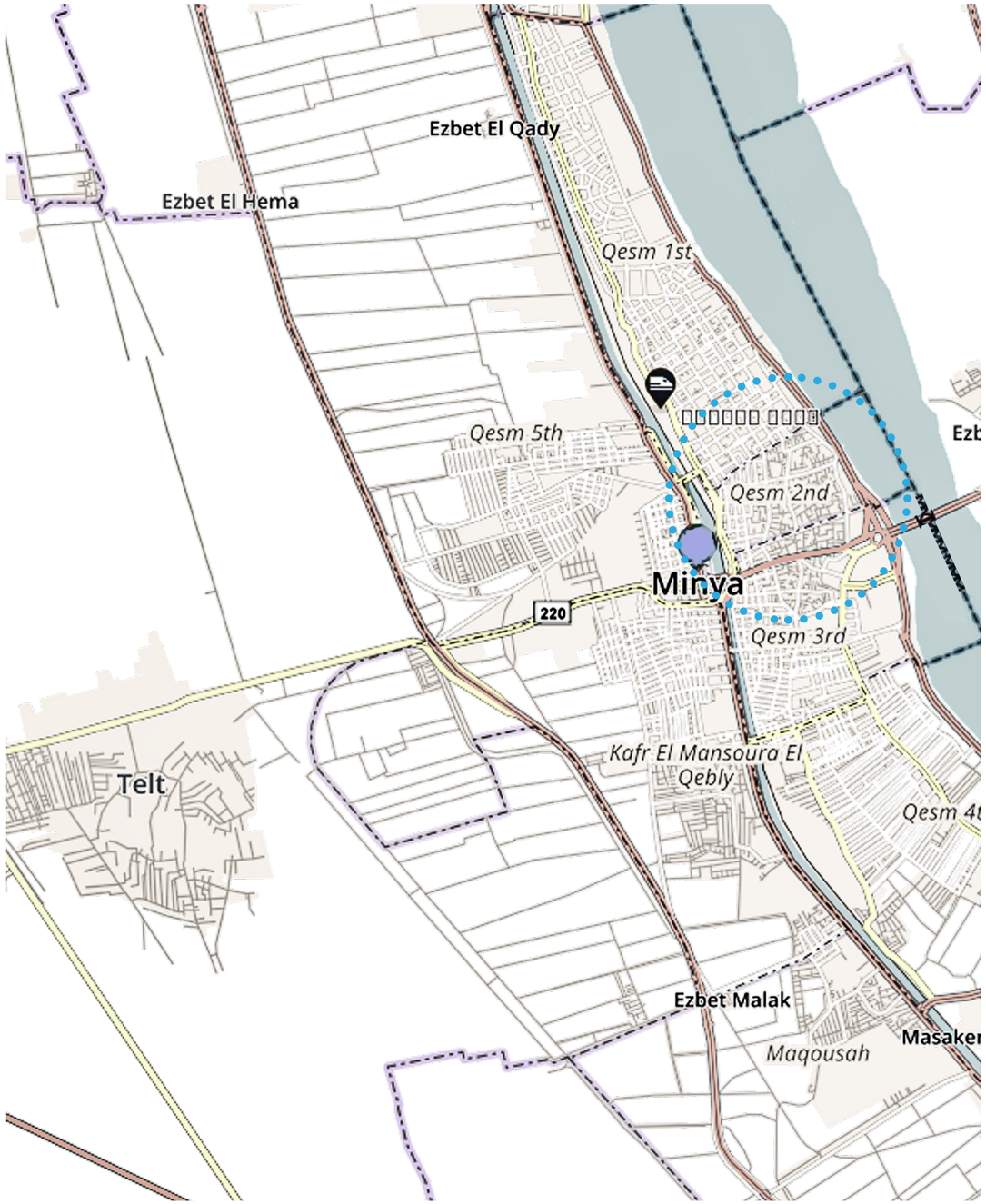
3.2.1 PRESENT SLUM TYPOLOGIES

DIFFUSE URBANISM

Characteristics defining diffuse urbanism:

- Starkly different 'urban' environments occurring in close proximity to each other
- Environments appear 'diffused' or disorganized
- Organic patterns in contrast to the clear geometric structures/patterns in a city
- No clear center
- 'Nodes' occur in favor of centers or networks
- 'Nodes' sometimes unclear in specific **function, yet possesses some sort of specialization**

Davis, Mike. Planet of Slums. 2007. p.9



Map sourced from MapQuest

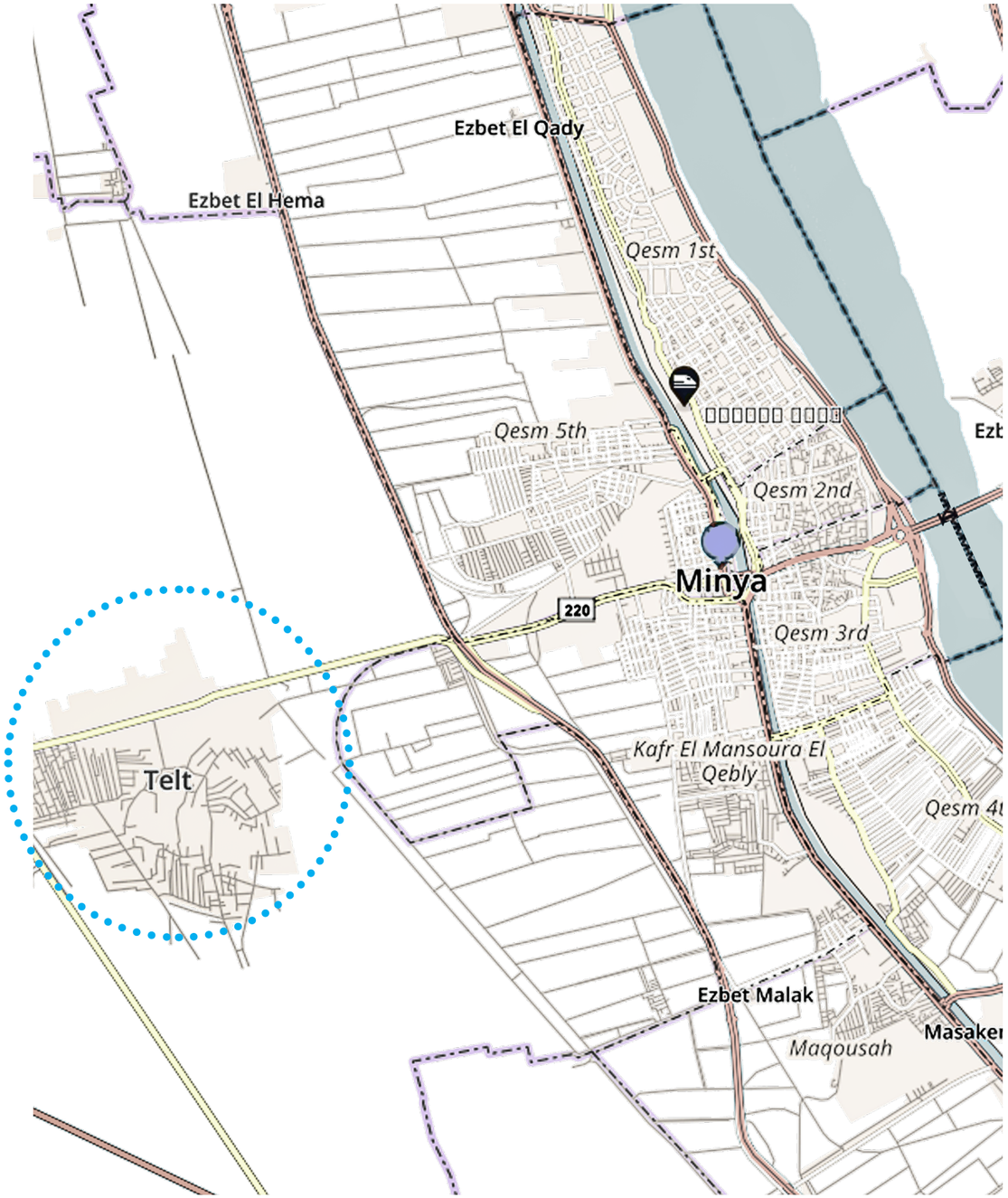
3.2.2 PRESENT SLUM TYPOLOGIES

DUAL-TRACK URBANISM

"Such 'extended metropolitan regions' ... represent a fusion of urban and regional development in which the distinction between what is urban and rural has become blurred as cities expand along corridors of communication, by-passing or surrounding small towns and villages which subsequently experience 'in situ' changes in function and occupation."

'In Situ': an example of dual-track urbanism, urban hybrid

Davis, Mike. Planet of Slums. 2007. p.8



Map sourced from MapQuest

3.3 SITE SELECTION AND ITS SIGNIFICANCE TO THE PROPOSED PROJECT

Minya, Egypt, was selected due to both its personal relevance and relevance to a general global issue where this thesis can be directly applied and tailored. While the causes and conditions of extreme poverty in Minya are specific to this region, they may also exemplify an issue that is present in various and numerous regions around the globe. From studying to conditions in Minya specifically, we may learn how to adapt the ideas suggested in this thesis to similar conditions and design challenges.

The conditions which lead to a severe issue of impovershment in Minya can be generalized into (but not limited to) several main categories:

- *Govermental Corruption / Negligence*
- *Lack of Potable Immediate Resources*
- *Difficulty Caused by Lack of Proximity and Access to Transportation*
- *Lack of Local Employment Oppurtunities*
- *Rampart Undereducation*
- *Religious Prejudice and Persecution*

By considering these issues in focus and relation to Minya, Egypt, we may be able to apply appropriate design methods and planning solutions. The methodology of design may be able to be applied to differing global conditions rooted from relating issues.

Photo by Louafi Larbi, 2013
"Bishop-General Macarius (6th l.), a Coptic Orthodox leader, prays with residents at burnt and damaged Evangelical Church in Minya governorate, about 150 miles south of Cairo, in August, 2013."

https://www.csmonitor.com/World/Middle-East/2014/1022/Egypt-s-Christians-attacked-for-supporting-Sisi-patiently-await-payback

3.4.1 DOCUMENTATION OF EXISTING SITE CONDITIONS

Pictured are two met sitting outside ruins of a church incinerated by unknown attackers in part of a hate crime. Attacks/conditions such as these are common in Minya. Many Christians in the city live in fear due to the commonality of these attacks and types of treatment. Religious predjudice and persecution is a major issue in the Minya governate and capital.

Gianluigi Guercia, “Minya, Egypt.” Getty Images. www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular

Pictured is the interior of a home of those living in poverty within the city of Minya. As discussed and studied earlier, these places are commonly left without basic utlities and unsafe/poor living conditions. According to the photographer of this photo, there is no running water in this single-room home. The mother pictured goes several times a day to the neighbor’s home with a bucket in order to just complete her daily chores.

Khaled Desouki, “Minya, Egypt.” Getty Images. www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular

Depicted in the picture left is the installation of a water pipe system in a residential area of Minya, previously living without resources. This was done as an effort by UNICEF in order to provide running and clean water to 1000 homes in upper Egypt.

Khaled Desouki, “Minya, Egypt.” Getty Images. www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular

3.4.2 DOCUMENTATION OF EXISTING SITE CONDITIONS

The left photo shows a typical condition of a public primary school in an impovershed area of upper Egypt (specifically Minya). As can be seen, the overall condition of the school room is very poor and even unable to accomodate the amount of children who attend.

Barry Iverson, "Minya, Egypt." Getty Images. *www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular*

Community is an enormous aspect when it comes to the success of an area. Among those struck by poverty, aspects of the natural surrounds are taken advantage of as oppurtunies for recreation and communal gathering. Shown above are some of Minya's inhabitants playing in the Nile river.

Anadolu Agency, "Minya, Egypt." Getty Images. *www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular*

Depticed again is people sitting outside of a church damaged by burning. Destruction of religious buildings with the intent of murder is a common theme among the hate crimes commited towards Minya's Coptic population. The Coptic population makes up a majority of those living under poverty.

Gianluigi Guercia, "Minya, Egypt." Getty Images. *www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular*

3.4.3 DOCUMENTATION OF EXISTING SITE CONDITIONS

Depicted in the photo above is the exterior conditions of a home within an impovershed area of Minya. This is a typical example among many others of similar condition.

Khaled Desouki, “Minya, Egypt.” Getty Images. *www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular*

Pictured above is a typical street view within a neighborhood in Minya sticken by poverty. From this photo we may be able to deduce exterior qualities and conditions. Not only can we see this in the physical attributes of these areas, but we may also observe the people and their qualities of life.

Khaled Desouki, “Minya, Egypt.” Getty Images. *www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular*

Depicted above is exterior conditions of a different typology of home in Minya, located within a Christian neighborhood. We can see that construction in these areas is often poor and unsafe. This is due to a number of factors, with the one most overwhelmingly impactful being lack of funds,

Luis Dafos, “Minya, Egypt.” Getty Images. *www.gettyimages.com/photos/minya-egypt?mediatype=photography&phrase=minya%2Begypt&sort=mostpopular*

3.5.1 HISTORICAL/NATURAL/GEOGRAPHICAL PATTERNS

A look into Minya's history can partially determine causes leading to the City and Governate's current shocking poverty rate. What was historically a profitable and promising city has deteriorated as a result of change in demand and foreign influence.

In 1861, there was high demand for Egyptian cotton. Minya, which produced large quantities of high quality cotton, benefited from this demand. The influx of wealth created a new upper class that consisted of native land lords, officials, and merchants. These wealthy families took residence in the Colonial part of the city and built palaces and high-end houses that were designed by Italian architects.

Around the start of the 20th century, land speculations and a general building boom marked the beginning of Minya's dramatic expansion. However, following the revolution of 1952, the Suez Crisis of 1956 and the subsequent nationalization of many industries, many non-Egyptian communities like the Greeks and Armeninans left Minya. This led to the beginning of the decline for the colonial district. During this period, movement of internal populations further accelerated disparities between the two parts of the city: the old city with its legacy of obsolescence and poverty, and the colonial district with its modern buildings and services. Densities continued to increase in the old city, where there were inadequate community facilities. The resultant overcrowding accelerated deterioration of both infrastructure and the standing housing stock.

In the 1960s, Ard AL-Mowled was developed as a public housing scheme to accommodate the exploding population growth of lower income residents of the old city. Around the beginning of the 1970s, the modern district of Ard Sultan began to be established according to land subdivision and zoning laws. Because of the high land price in the area, it attracted upper and middle-income groups who left the deteriorating colonial city. [1]

1: "Emad El Din Aly (2003). Visual Design Guidelines For Medium-sized Cities, the Case of El-Minya City-Egypt

Because of historical patterns along with the influence of governmental corruption, undereducation, religious prejudices, and so on, we fine the rate of poverty exceeds 60% in Minya, where the total population is around 6 million. In recent events, the government has made an attempt to provide assistance to alleviate the effects of poverty on the area via "social safety networks," which in specific are financial assistance to the high rate of disabled inhabitants.

Along with this, efforts were made in 1981 with the Basic Village Service Program (BVS) of USAID conducting several water, and road projects, located in several areas of the Minya Governorate.

In 2013, in another effort conducted by the United Nations, The United Nations Trust Fund for Human Security assisted farmers located in the Minya Governate through consultation work, taking soil samples in order to determine potential agricultural paths and opportunities.
[1]

3.5.2 HISTORICAL/**NATURAL/GEOGRAPHICAL PATTERNS**

Climate
Köppen-Geiger's system classifies Minya's climate as a hot desert. The city is located between two ranges of about 1,600 ft mountains on both western and eastern sides, and falls away from the Mediterranean Sea and the Red Sea. These conditions give the city a continental climate- classified with harsh and chilly cold winters, and hot but non-humid summers.

Geography
Minya is the capital of the Minya Governorate in Upper Egypt*. It is located approximately 152 miles south of Cairo on the western bank of the Nile River, which flows north through the city.

*Contrary to what the name suggests, Upper Egypt refers to the altitude and flow of the Nile River. Upper Egypt is South of Lower (Northern) Egypt, which consists of the major cities of Cairo and Alexandria.
[1]

1: "Climate Data: Minya, Egypt." Climate, en.climate-data.org/africa/egypt/giza-governorate/al-minya-478410/.

3.6 PEDESTRIAN AND VEHICULAR PATTERNS & CONDITIONS

The map below depicts Egypt's overall travel paths.[13] In order to see Minya in relation to Egypt as a whole, the region is circled. As can be seen below, there is one central rail system that travels between upper and lower Egypt.

Below is the circled region zoomed in to see details. In terms of pedestrian patterns, Minya is planned as a city, so walkability is not a primary issue. A primary issue lies in the lack of public transportation available around and out of the city, with only one rail line in place. Minya is also accessible by bus, though the bus runs along the same route as the rail line.

Egypt Transportation Map, www.globalcitymap.com/egypt/egypt-road-map.html

3.7 SITE POTENTIALS AND CONSTRAINTS TO THE PROPOSED PROJECT

POTENTIALS:

- Prexisting infrastructure is in place:
  - The site is completely paved over and flattened, providing for opportunity to build easily with minimal new disruption of the land.

- Proximity to commuter rail:
  - Commuter rail is ~1 km. from the selected site. This is around a 15 minute walk, providing easy access to those who must travel to Cairo for work

- Strong communal ties are established among the people of Minya:
  - A strong basis in community is a mighty step towards a good foundation to creating a successful society

- Nile River is in reasonable proximity:
  - The Nile river provides both fresh water to provide to areas with limited resources, along with fertile soil for agricultural development

- Vast space is available for design:
  - Aside from the site inself, surrounding Minya is a huge amount of land consisting of desert conditions. This may be able to provide area for utilities and other possibilities of reasonable expansion

- Rich cultural history can be taken to advantage in design aspects:
  - An already established vernacular of design pushes innovation by limiting to said style, promoting creative thinking and design

CONSTRAINTS:

- Surrounding desert area is limited in resources and feasibility for habitation

- Many areas unfit for living or construction

- Much of the government is unwilling to help or comply

- Limited monetary resources

- Limited transportation

- Limited local resources

- Already present strong socio-economic and religious splits/boundaries

- Undereducation in communities struck by poverty

SECTION 4: DESIGN

4.1 SELETED SITE

CONTEXT BREAKDOWN

due to limited data some areas are approximated or inferred

SITE (PROPOSED SHOWN)

RESIDENTIAL:

DETACHED OR LOW-MID RISE

MID-HIGH RISE

MIXED USE

TRAIN/TRANSIT

RAIL LINE

INDUSTRIAL

EDUCATION

HEALTHCARE/HOSPITAL

RETAIL/OFFICE

RELIGIOUS

GOVERNMENTAL

4.2 GENERAL PROGRAM

As stated in the beginning of this thesis book:

The design project will be a minimalistic community created from shelters encompassing the elements of "home," using creative and innovative implementation of the limited sources and materials easily accessible and transportable to Minya, Egypt.

According to this, a general program can be devised in order to address all considered aspects of creating a humanifyingly sustainable version of a "home" for Minya's population of people sticken by a situation of extreme poverty.

Ultimately, the program will be masterplanned based on the incremental housing concept studied in the precidents. where items are able to be placed and moved where and when necessary. This should be done by modularity, due to the nature of Minya already being an established city with a history of persecution following certain groups.

The following list of program is the base of the design, oriented in a fasion to facilitate community and social bonds.

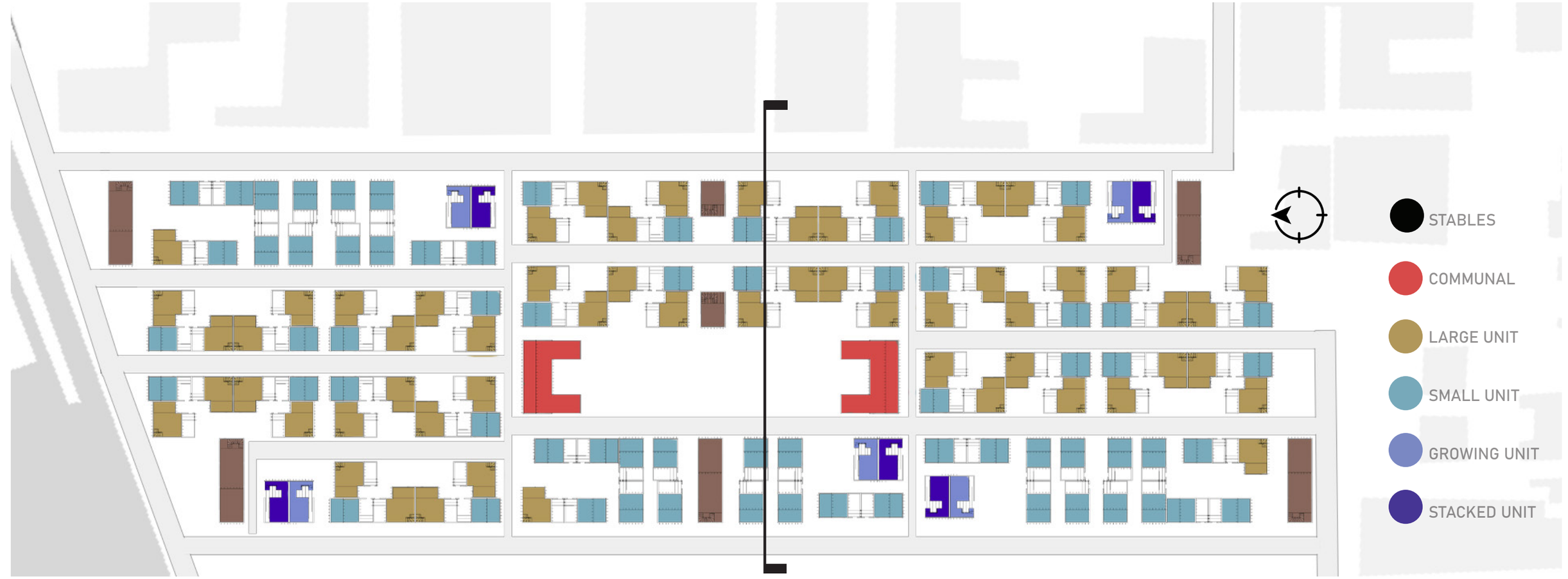
PROPOSED PROGRAM:

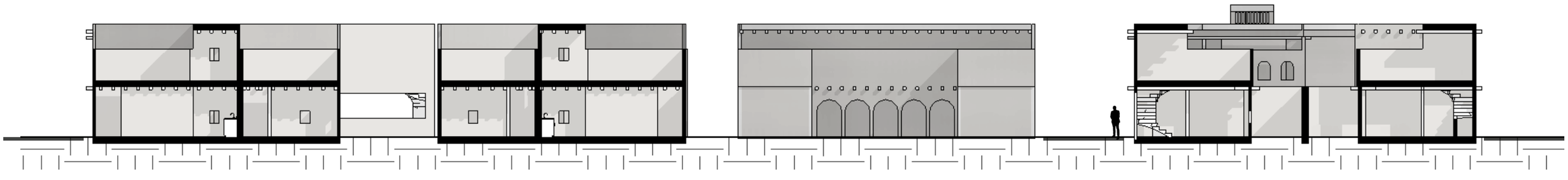
- Modular Housing Prototypes:
  - These prototypes include a system to access resources needed for basic human life, and be built with locally accessible resources (mud-brick construction, primative methods).
    Preexisting paved infrastructure will be used when appropriate, which will consist mainly of circulation paths and foundational slabs.
    To bring plumbing/water to the units, help should be requested to UNICEF, which may provide labor through volunteering to create a system.

- Community Space:
  - Both healthy familial and healthy communal relationships are crucial in the success of life, making these spaces necessary for the overall vision of creation of life equity among the impovershed in Minya.
    These spaces should be geared around both children and adults, providing different types of mental and social nourishment. These will be no-cost spaces to partake in, such as a central soccer field.

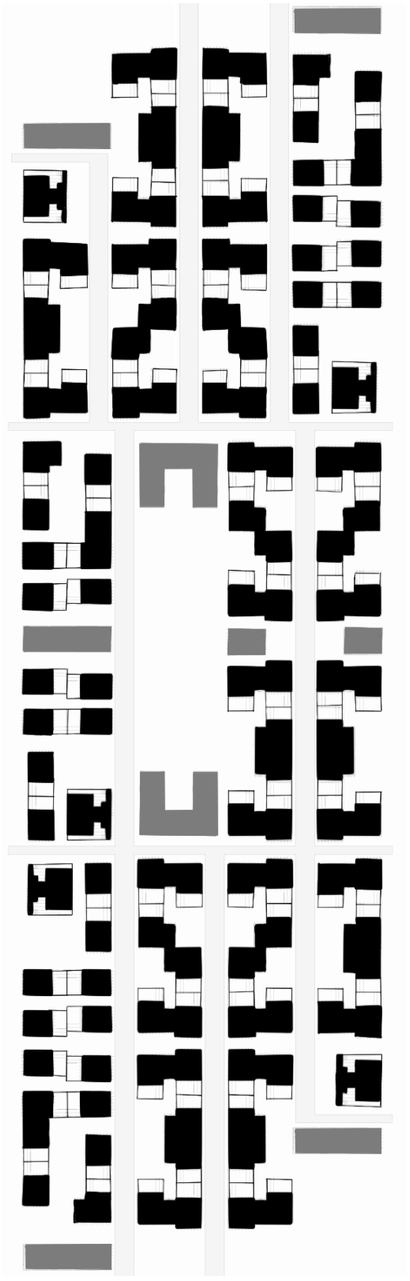
- Agricultural Facilities:
  - Among those victim to poverty who are employed, a majority travels long distance to Cairo. The Nile river provides an oppurtunity for work in agriculture, much of it being underutilized and holding great potential. Creation of these areas will faciliate jobs locally. Stables are to be built for inhabitants owning livestock a common occurance in the lifestyle and culture.

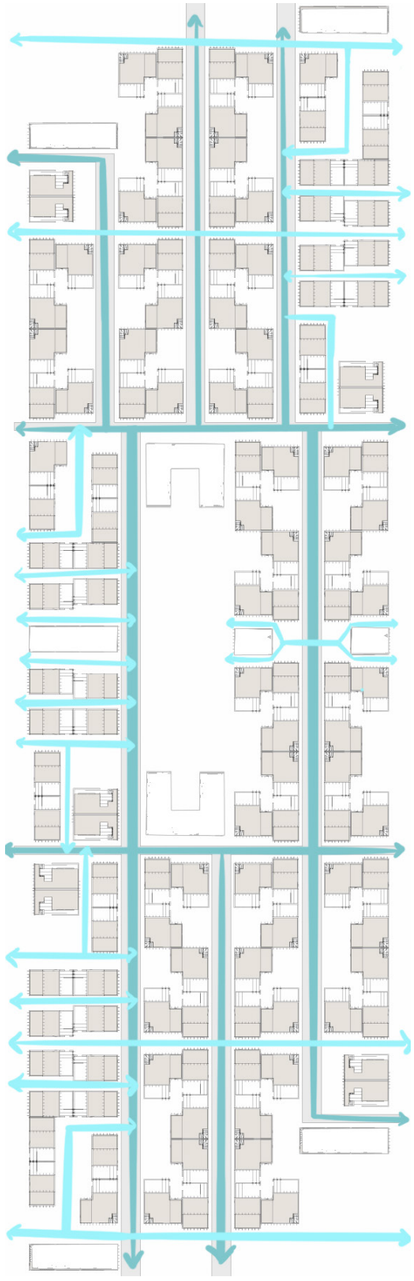
4.3 MASTERPLAN: **BUILDING PROGRAM**

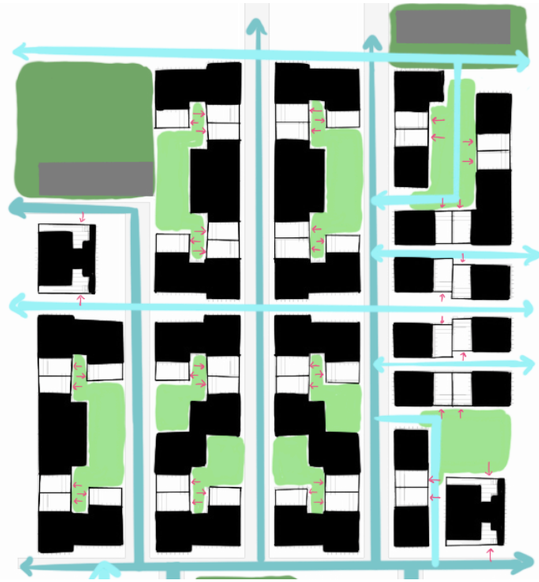




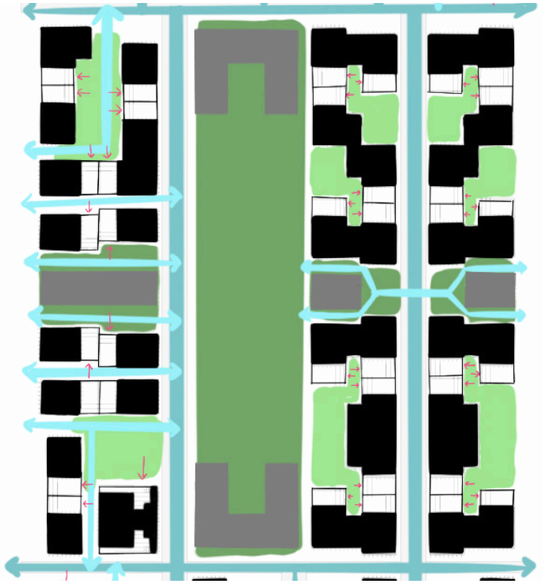
4.4 MASTERPLAN: **DIGRAMMING DESIGN**







NEIGHBOORHOOD CONCEPT:
LAYOUT 1



NEIGHBOORHOOD CONCEPT:
LAYOUT 2

Void Space, visible in the farmost left diagram, displays areas left for an incremental aspect. By allowing space for future growth, the final homes will reflect the needs and individuality of the inhabitiants.

- SOLID
- COMMUNAL BLDG
- VOID
- STREET CIRCULATION
- PEDESTRIAN
- COMMUNAL GARDEN
- PUBLIC COMMUNAL
- UNIT ENTRY

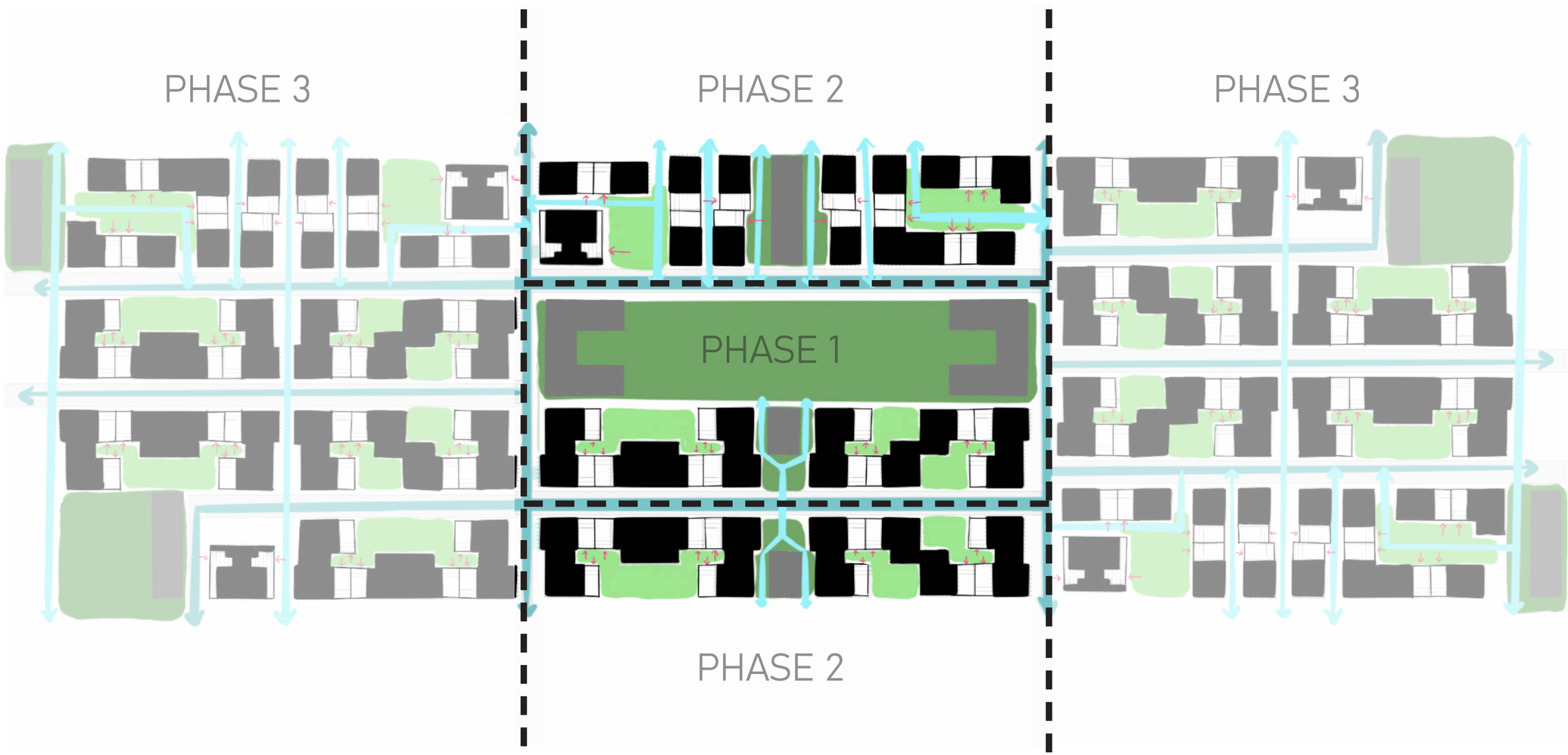
4.5 PHASING

This project is designed so it is able to be built by those who will dwell within. This is done for a multitude of reasons, the major ones being autonomy, customization to inhabitant, creation of communal ties, and providing a “base” for outward expansion. As such, the project must be built in phases in order to create the defined communal space for the rest of the project to build off of.

Phase 1 consists of the communal buildings (daycare and community center). These are done first so inhabitants have a safe place to both put their children and a safe place to congregate during ongoing construction.

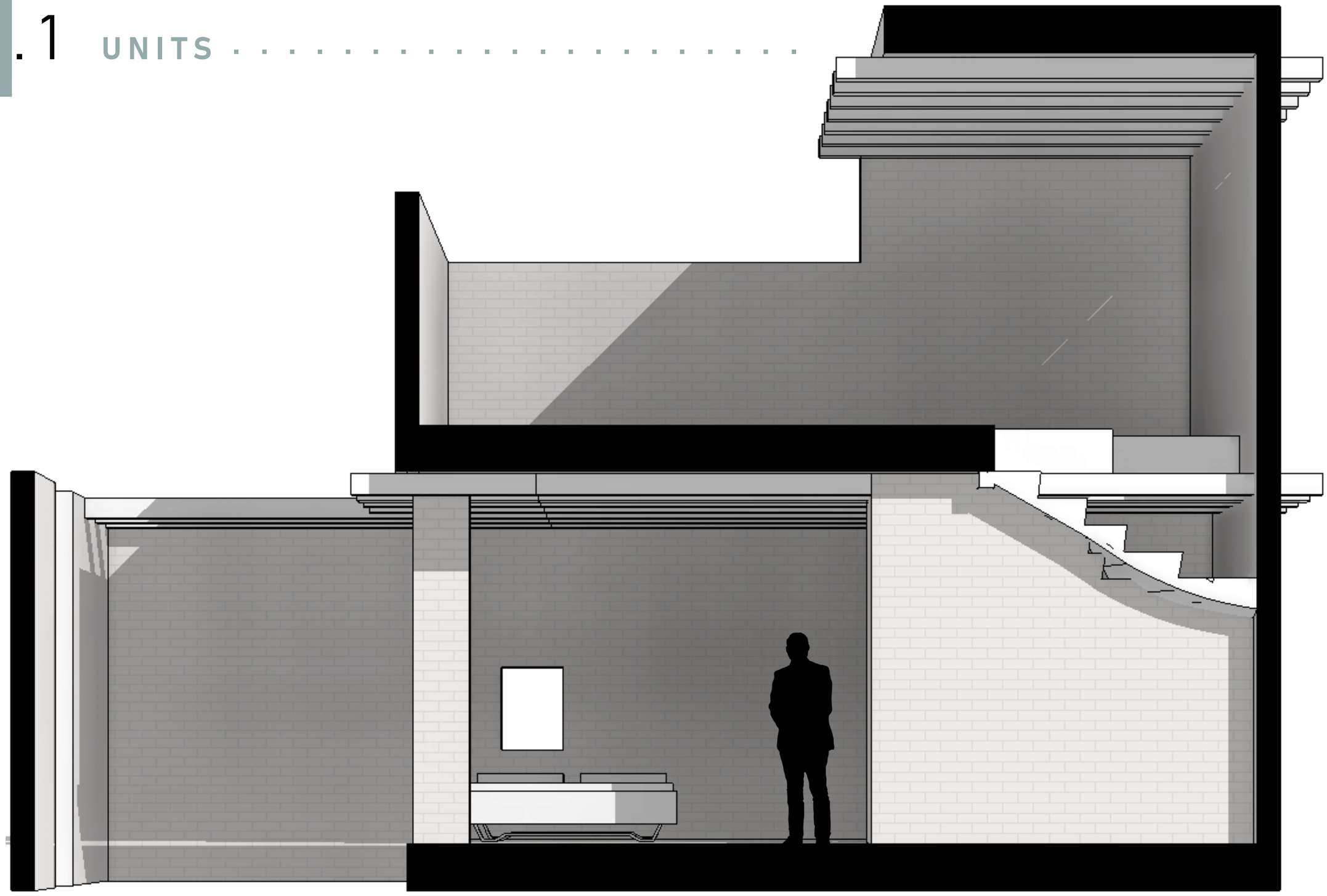
Phase 2 consists of outward growth directly surrounding the main communal area. This provides safety and enclosure though the ideology of “eyes on the street.”

Phase 3 consists of outward growth from the center neighborhood, creating more intimate communities and smaller gathering spaces.



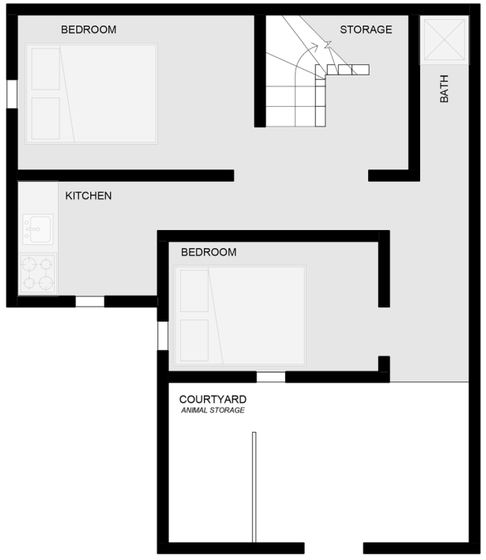
At the end of Phase 3, it is possible to rotate, replicate, and adjust this plan modularly across the remaining areas of the large site. By having some of the site left unbuilt, it allows for growth dependant on a need-base.

4.6.1 UNITS

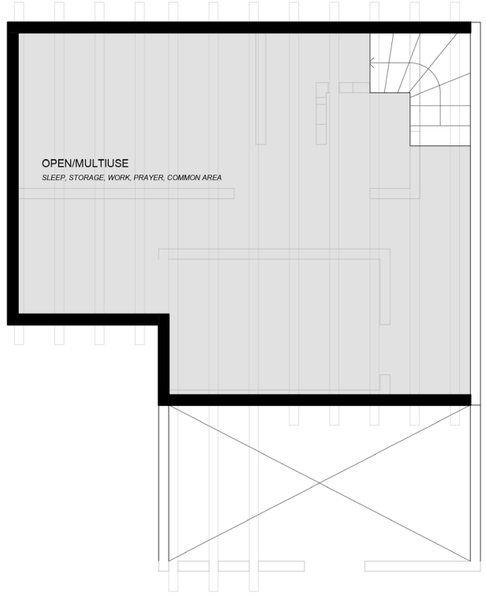


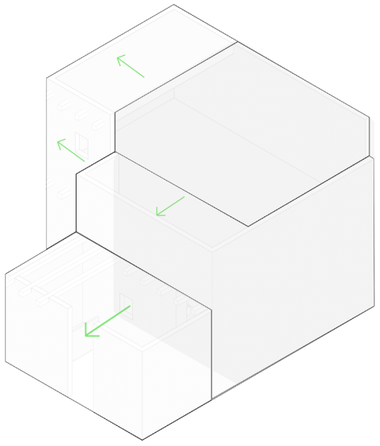
LARGE FAMILY ORIENTED UNIT

EGYPT HOUSE L1

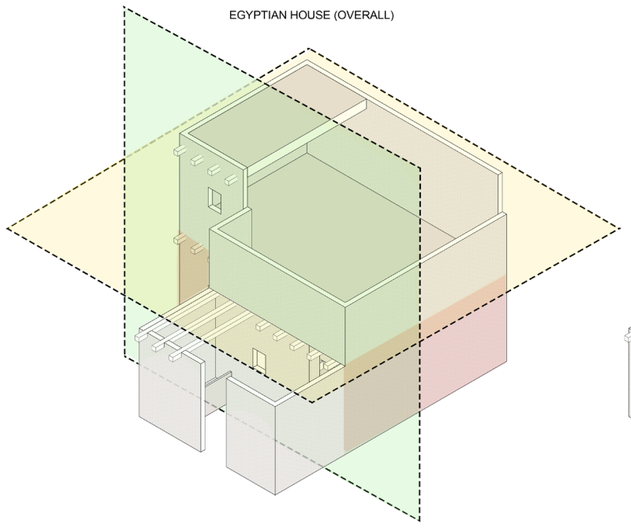


EGYPT HOUSE L2

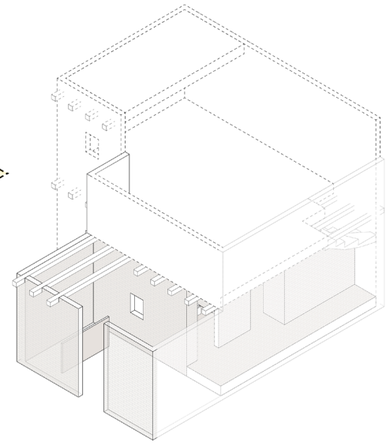




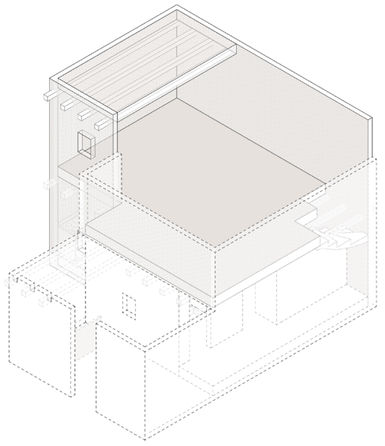
EGYPTIAN HOUSE (OVERALL)



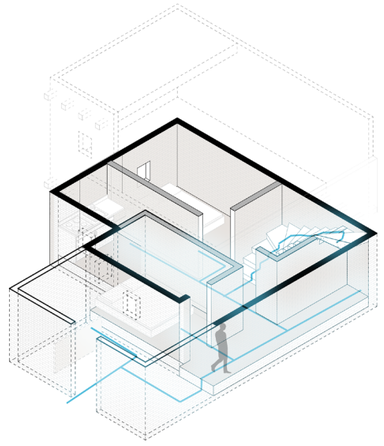
EGYPTIAN HOUSE (COURTYARD)



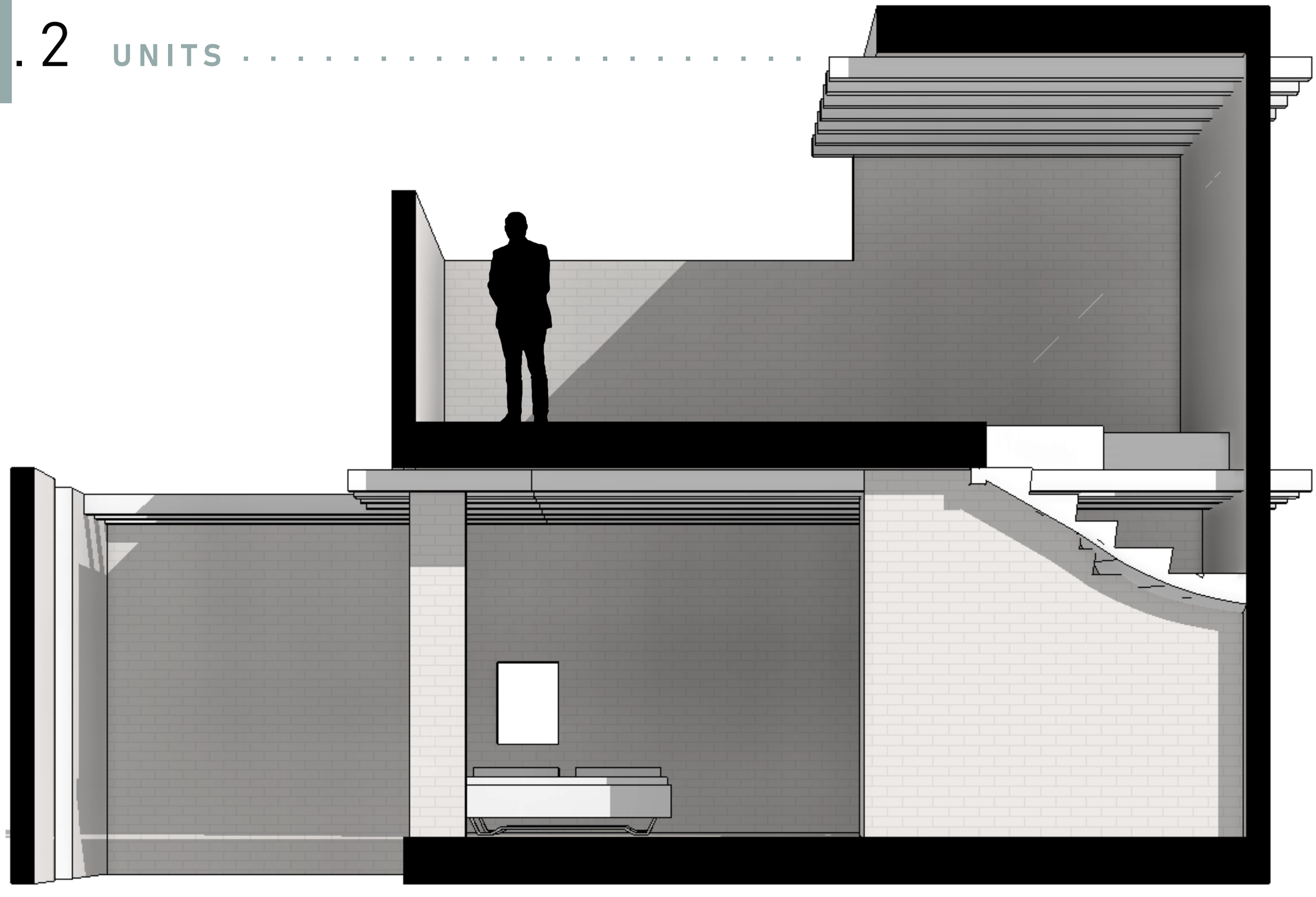
EGYPTIAN HOUSE (ROOFTOP)



EGYPTIAN HOUSE (MAIN)

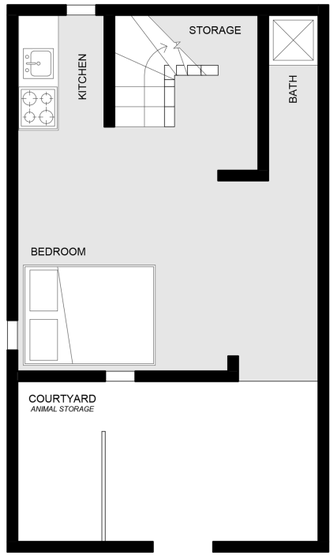


4.6.2 UNITS

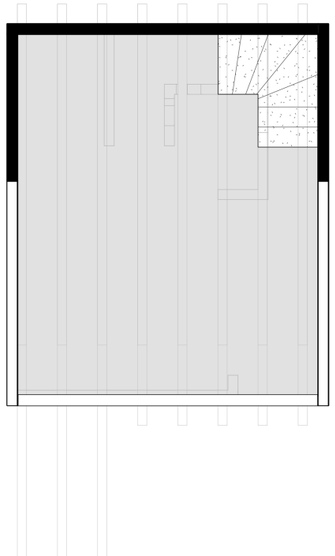


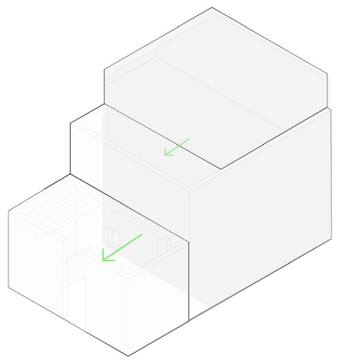
SMALL FAMILY ORIENTED UNIT

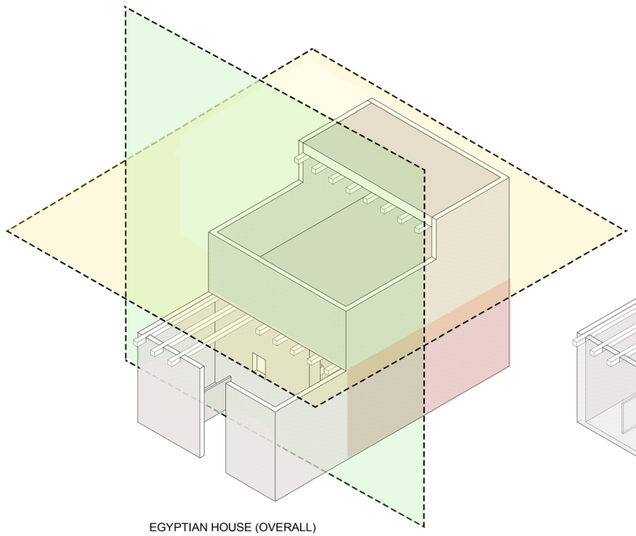
EGYPT HOUSE L1



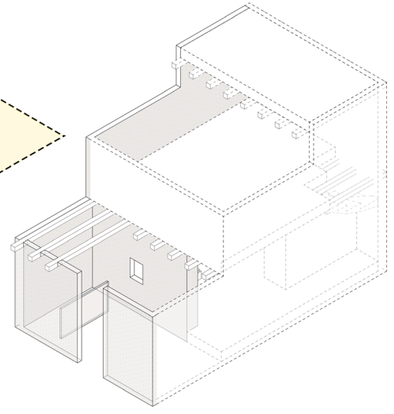
EGYPT HOUSE L2



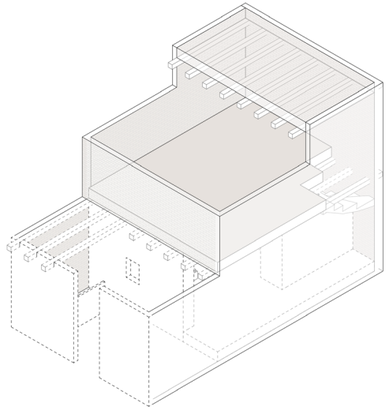




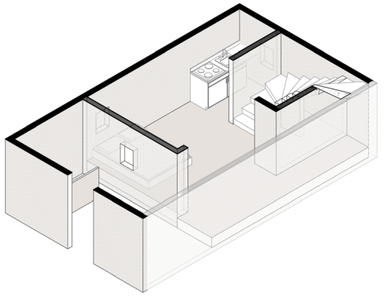
EGYPTIAN HOUSE (OVERALL)



EGYPTIAN HOUSE (COURTYARD)



EGYPTIAN HOUSE (ROOFTOP)

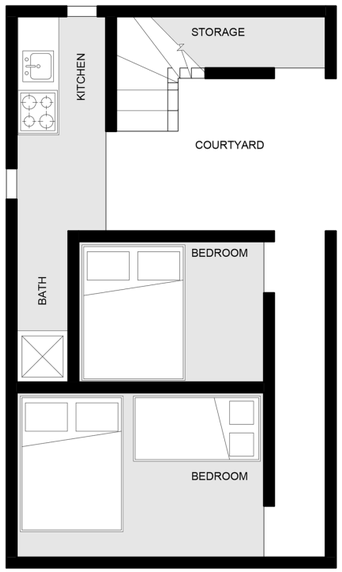


EGYPTIAN HOUSE (MAIN)

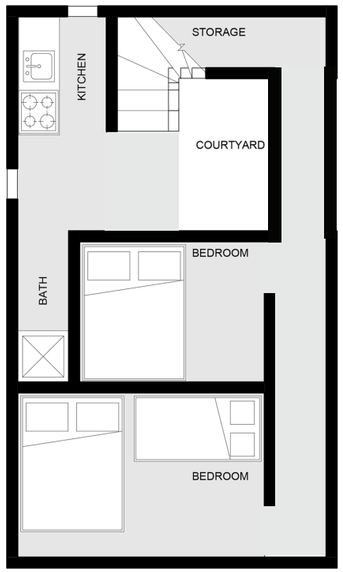
4.6.3 UNITS

STACKABLE UNIT | GROWING FAMILY UNIT

EGYPT HOUSE L1

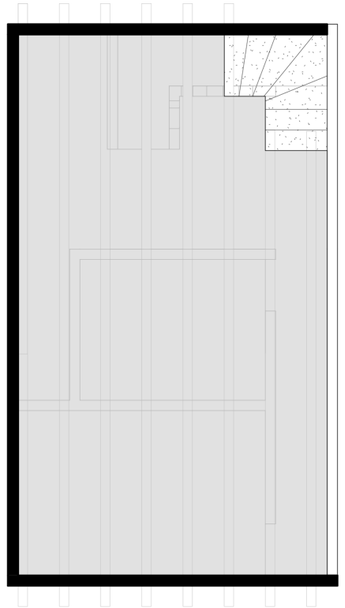


EGYPT HOUSE L1

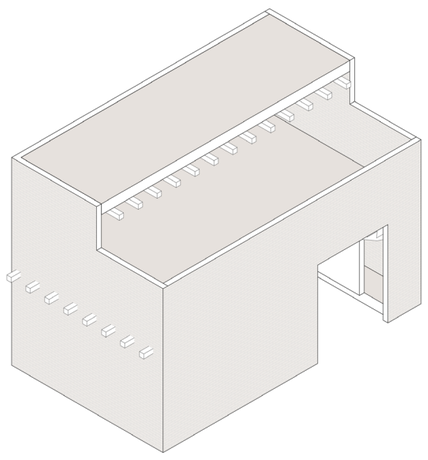


[STACKED UNIT]

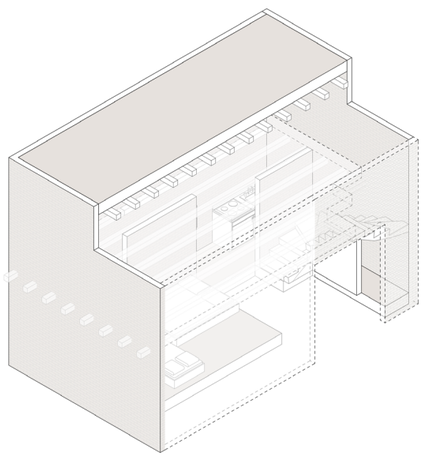
EGYPT HOUSE L2



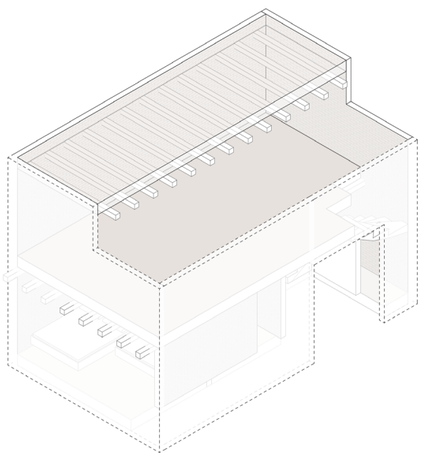
[GROWING UNIT]



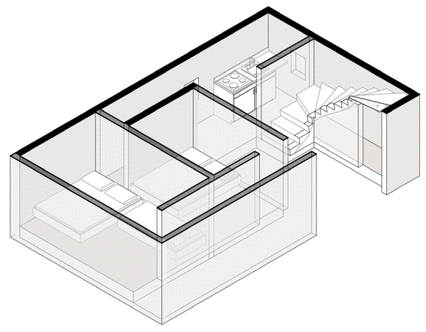
EGYPTIAN HOUSE (OVERALL)



EGYPTIAN HOUSE (COURTYARD)



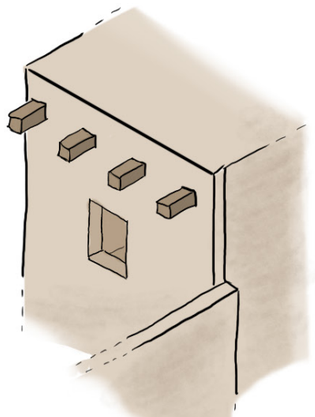
EGYPTIAN HOUSE (ROOFTOP)



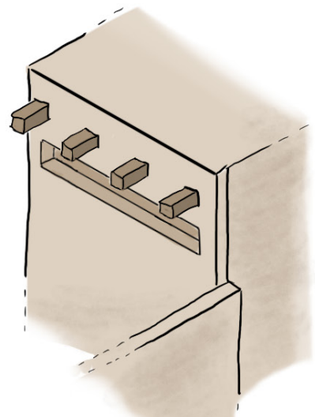
EGYPTIAN HOUSE (MAIN)

4.7 CUSTOMIZABLE ASPECTS

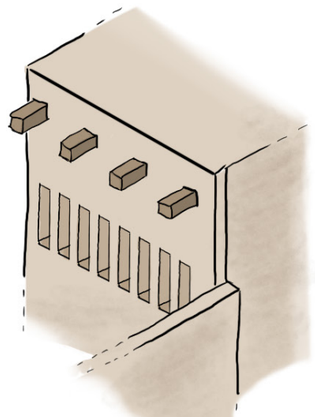
Punched
-Fastest/Easiest Construction
-Low Privacy
-High Light Access
-High Air Flow



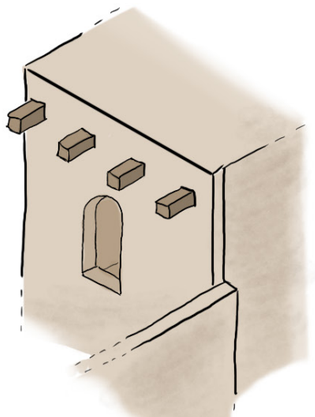
Clerestory
-Fast/Easiest Construction
-High Privacy
-Medium-High Light Access
-Low Air Flow



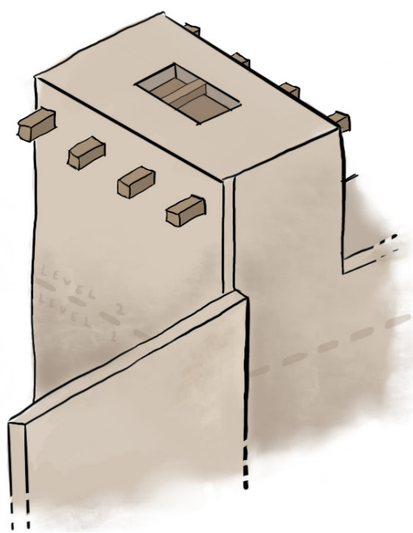
Slotted
-Medium/Easy Construction
-Medium Privacy
-Medium Light Access
-High Air Flow



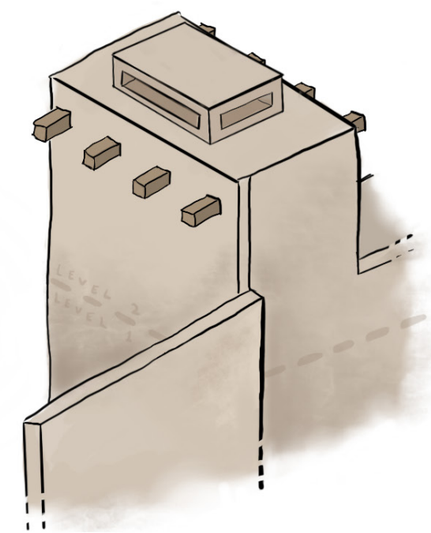
Arched
-Slow/Medium Construction
-Low Privacy
-High Light Access
-High Air Flow



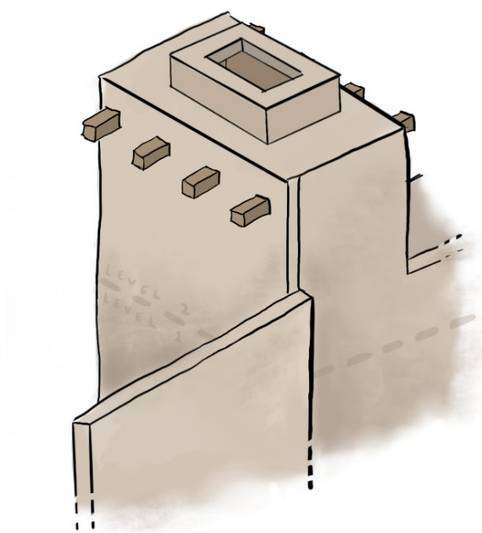
Punched
-Fastest/Easiest Construction
-Takes from Usable Space
-High Light Access
-Low Air Flow



Raised Clerestory
-Extra Construction
-Creates Opportunity in Usable Space
-Medium-High Light Access
-High Air Flow



Raised Punched
-Extra Construction
-Takes Small Amount of Usable Space but Creates Opportunity
-High Light Access
-Low Air Flow



4.8.1 RENDERS: **COMMUNAL SPACE FROM CLUSTERS**

4.8.2 RENDERS: **CENTRAL COMMUNITY SPACE**

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